

City of Flagstaff

USGS

Campus

Master

Plan

SMITHGROUP
architects engineers planners

City of Flagstaff
USGS
Campus
Master
Plan



USGS is a world leader in the natural sciences through our scientific excellence and to society's needs.

Vision

Mission

- The USGS serves the Nation by providing reliable scientific information to:
- Describe and understand earth;
 - Minimize loss of life and property from natural disasters;
 - Manage water, biological, energy, and mineral resources;
 - Enhance and protect our quality of life

The City of Flagstaff, in cooperation with USGS has completed the Master Plan that will create an interconnected USGS facility along with a private Science and Research Park. This Master Plan is the result of a team-oriented, highly participatory planning process involving representatives from USGS, the City of Flagstaff, and community representatives. The planning process focused on the accommodation of proposals for new and expanded programs and services which provide a response to the new and increasing demands that have been identified by the science community.

Goals

The directional force for the Master Plan builds upon and reinforces the USGS mission and strategic plan. The goals of the Master Plan are to reinforce the Sustainable vision of USGS & the City of Flagstaff, improve the function and improve the quality of life for the staff of the USGS campus, optimize the use of the existing property and develop a framework for current and future growth for the USGS campus. A secondary mission of this plan is to direct the development of a comprehensive research community that would facilitate the technology transfer between USGS and the private sector.

Campus

The majority of the existing buildings on the campus were built in the mid-1960's to the mid-1970's and is composed of either tilt-up concrete or masonry block walls with flat roofs. These original buildings, with exception of building 3, are at the end of their useful life. The general layout and design of the buildings along with their mechanical systems are not energy efficient as well as the physical structures are in need of very costly renovation work, that would include ADA compliance, environmental remediation and updating of mechanical systems along with changes to meet new General Services Administration safety concerns.

Currently, many of the USGS departments are split between multiple buildings within the existing campus. The existing lab facilities are operating in less than ideal conditions. The

many years of department growth, reductions, relocations and remodels has created an environment that is a very inefficient use of the existing space.

The potential of growth in the near future for the USGS Campus is very great. With the current president's desire to increase our effort in space exploration as well as the potential of having portions of the USGS's Menlo Park - California Campus staff and functions relocate to the Flagstaff Campus, the growth could exceed 40 percent for the existing campus.

The USGS Environmental research and mapping efforts are truly Flagstaff's (if not Arizona's) unknown asset. The work performed on the campus beneficially impacts everyone living in the southwest if not worldwide. Amazingly, many locals do not know what exciting and important research is occurring in their own backyard. The Master Plan was conceived with the goal to create a means for the public to see and understand the history of the work that the USGS has completed as well as current or ongoing research efforts. A "Welcome Center" facility is planned for the community and students to visit and see first hand, displays of USGS's Flagstaff Campus research efforts. The Welcome Center will include the Campus Library, Administration Offices and multipurpose meeting/conference room. This facility will be centrally located on the site to create a "hub" for the USGS Campus and the future Science Park. It will serve as the secure entry point for all visitors to the USGS Campus.

The Intent of the Master Plan is to create a “friendly” or community front door that is easy to find, attractive and has a building image that is indigenous to the Flagstaff climate and culture. The campus will provide a sense of place and proper identity for the USGS and Science Park staff. The current “sea” of parking lots will be moved to the outer edges of the site, separating cars and pedestrians and creating a naturally landscaped or reforested interior. Interior campus areas will be sculpted to create interaction space for staff and could be used for events like the annual community science fairs. The exterior boundaries of the campus will be developed to respect the natural surroundings of the Mesa including Buffalo Park, the Arizona Trail, Flagstaff Urban Trail and the Mesa's topography.

Current inefficiencies of the distributed labs and departments will be corrected. A strategy for building expansion and department growth has been implemented into the framework of the master plan. A new lab building will be constructed to accommodate all of the USGS's current laboratories as well as provide a means to be flexible for future ever-changing research needs. Buildings will be designed to be “sustainable”, reflecting the USGS's and the City of Flagstaff's environmental missions. Materials will be used from sources that are local or regional and that are renewable and or recycled.

Implementation

The Master Plan will be implemented in three construction phases. The first phase will include the construction of the new lab and office building, site utility infrastructure,

relocation of vehicular parking and the development of the first half of the interior pedestrian campus. The second phase will include the demolition of two buildings – the warehouse and building 4. The new warehouse, vehicular compound and remaining site work will be constructed. The final phase will include the welcome center and various renovations to building 3 and backfilling spaces within building 6.

At the completion of this master planning process, the effort to finalize the historic review and determination of building two's large format camera is near completion but is unfinished. Under the terms of the Memorandum of Agreement between the City of Flagstaff, Arizona State Historic Preservation Office (SHPO), GSA, USGS, and the Advisory Council on Historic Preservation, the Master Plan must consider any historic resources that might be affected by Master Plan development, and the Plan will undergo a Section 106 review, pursuant to 36 CFR 800. As part of the planning process and prior to the implementation of phase one, an open forum with the public and SHPO will be held to discuss any historic events that occurred in building two. The outcome of this meeting as well as the final decision on the filed Section 106 review, will determine the outcome of the large format camera and building two. The master plan has accommodated multiple options for this remaining issue. The entire camera can be part of the New Welcome Center's public displays – where the general public can view and learn more about the camera and the historical event, or if necessary, building 2 can remain and be developed into the Master Plan.

Conclusion

This Master Plan is a flexible framework for the existing needs of the USGS and for future growth strategies. The Master Plan should become a “living document” that accommodates changes within the USGS Campus, Science Park as well as the surrounding community.

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Statement of Purpose

The purpose of the Master Plan is to establish a basis for coordinating physical development decisions to:

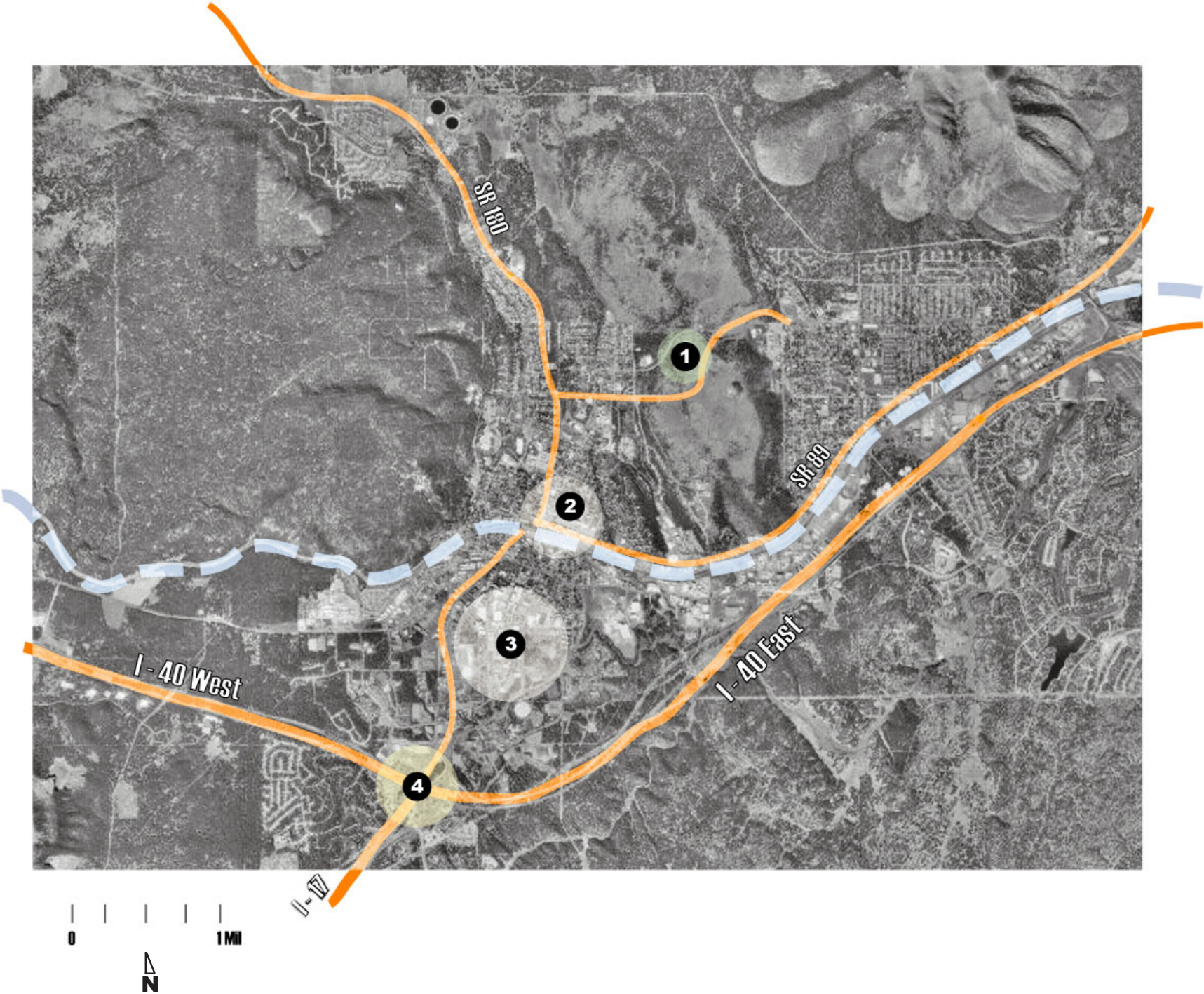
- **Reinforce** the vision of the USGS campus.
- **Improve** the function of the USGS campus for staff and the community.
- **Develop** building design concepts along with necessary refinements to the overall Master Plan that deliver quality space and architecture to USGS.
- **Improve** the quality of life for staff and visitors.
- **Optimize** the use of existing property and recognize anticipated future adjacent land uses.
- **Solve** the much needed parking/entry/ service challenges that exist today on the campus.

The Master Plan that resulted from this effort addresses these planning goals by acknowledging the physical framework systems (development patterns, open space, pedestrian circulation, parking, vehicular circulation, service and utilities), which most fundamentally influence the USGS campus appearance and functionality.

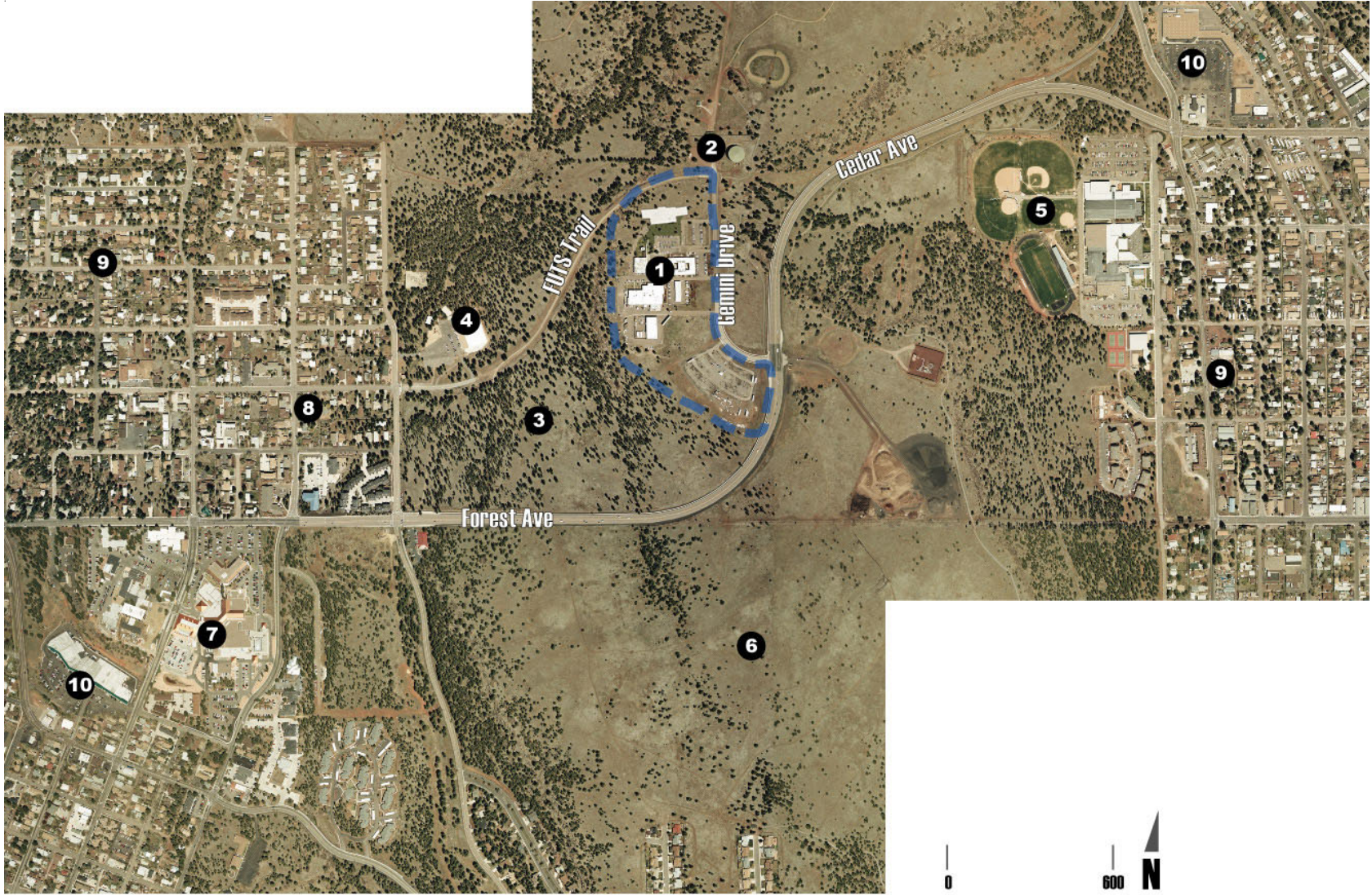
In summary, the Master Plan is concerned with physical development and provides a framework for long-term planning that is clear and flexible – responding to changing needs and conditions. The Plan is not intended to be a detailed blueprint for building construction, rather, it demonstrates how the many factors that influence the quality of the USGS campus environment should work together to create a functional environment for the purpose of delivering a world class research environment. Piecemeal decision-making that treats individual building and improvement projects as discrete and unrelated elements will detract from the preferred homogeneous feel of the campus. Continued periodic updating of the Plan will be required to remain current with research activities, standards and other unknown initiatives or technologies that will become relevant in the future.

Strategic Issues and Direction

- *Combine and enhance USGS’ diverse programs, capabilities, and talents and increase customer involvement to strengthen our scientific leadership and contribution to the resolution of complex issues.*
- *The scientific nature of USGS, its national perspective, and its non-regulatory role, enable USGS to provide information and understanding that are policy relevant and policy neutral.*
- *Continue to be the science provider of choice in accessing information and understanding to help resolve complex natural resource problems across the Nation and around the world.*
- *Continue attracting the best and brightest experts who bring a range of earth and life science disciplines to understand complex natural phenomena.*



- USGS Campus 1
- Downtown Flagstaff 2
- NAU Campus 3
- I-17/I-40 Interchange 4



PL-O

Public Lands Open Space

The PL-O district is designed to protect established public lands and to provide an area in the City for the location of parks, public open space, governmental buildings and facilities, schools and school grounds, quasi-public buildings and facilities, and the related uses

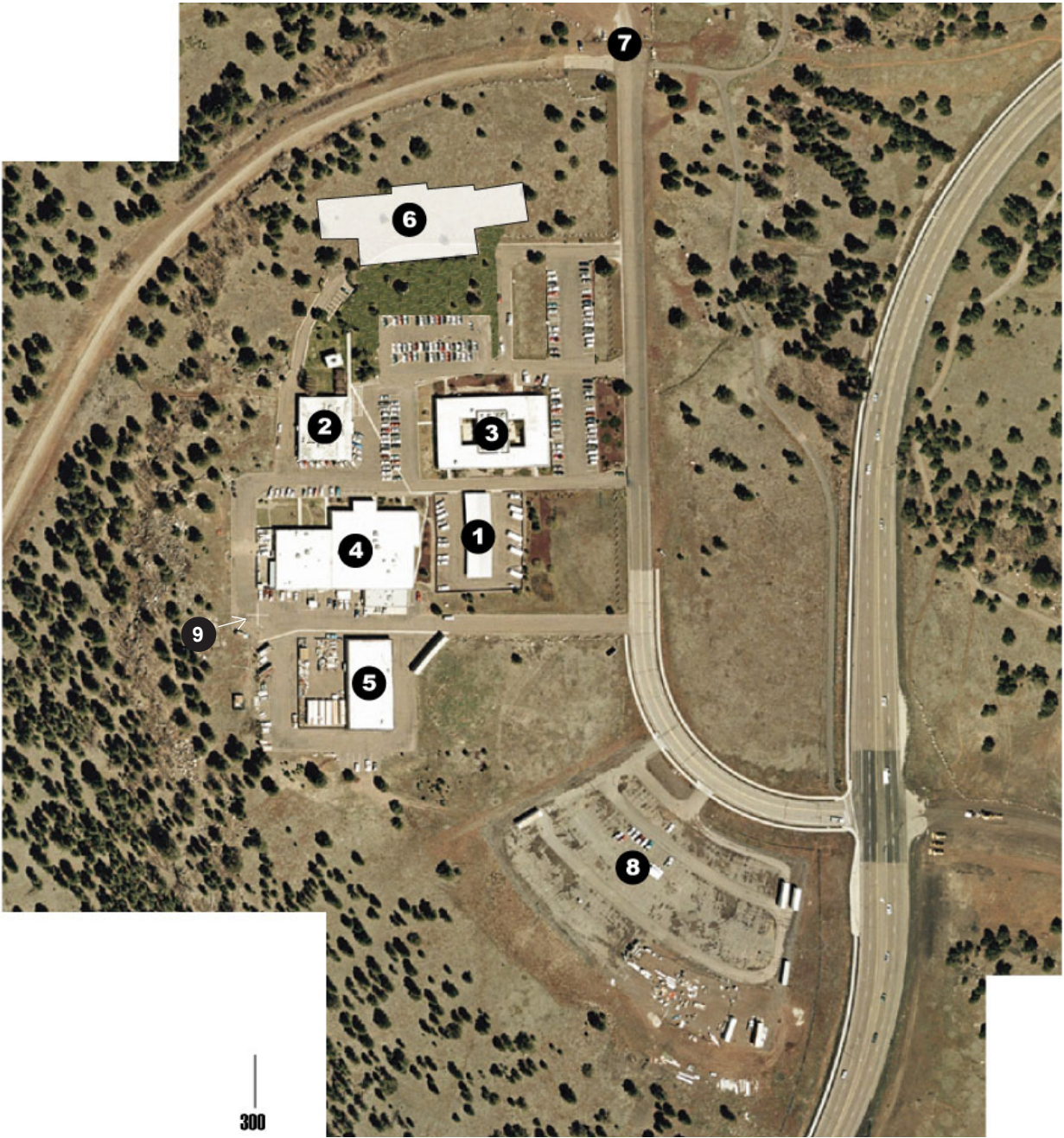
**building
zoning**

- USGS Campus
- Buffalo Park
- McPherson Park
- Ice Arena
- Coconino High School
- McMillan Mesa
- Flagstaff Medical Center
- 2-3 storey residential
- single family residential
- commercial/retail center

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

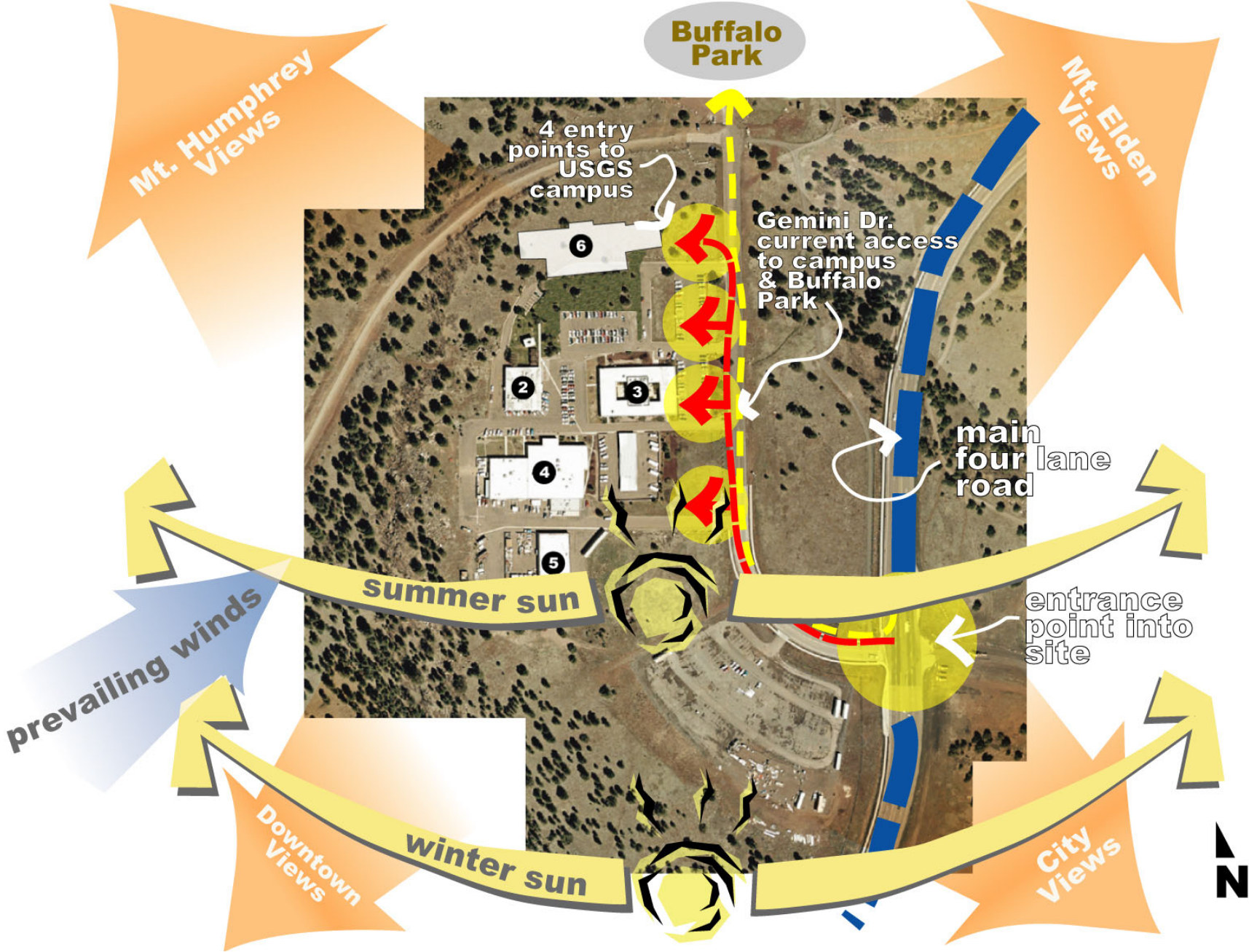
**context
map
legend**

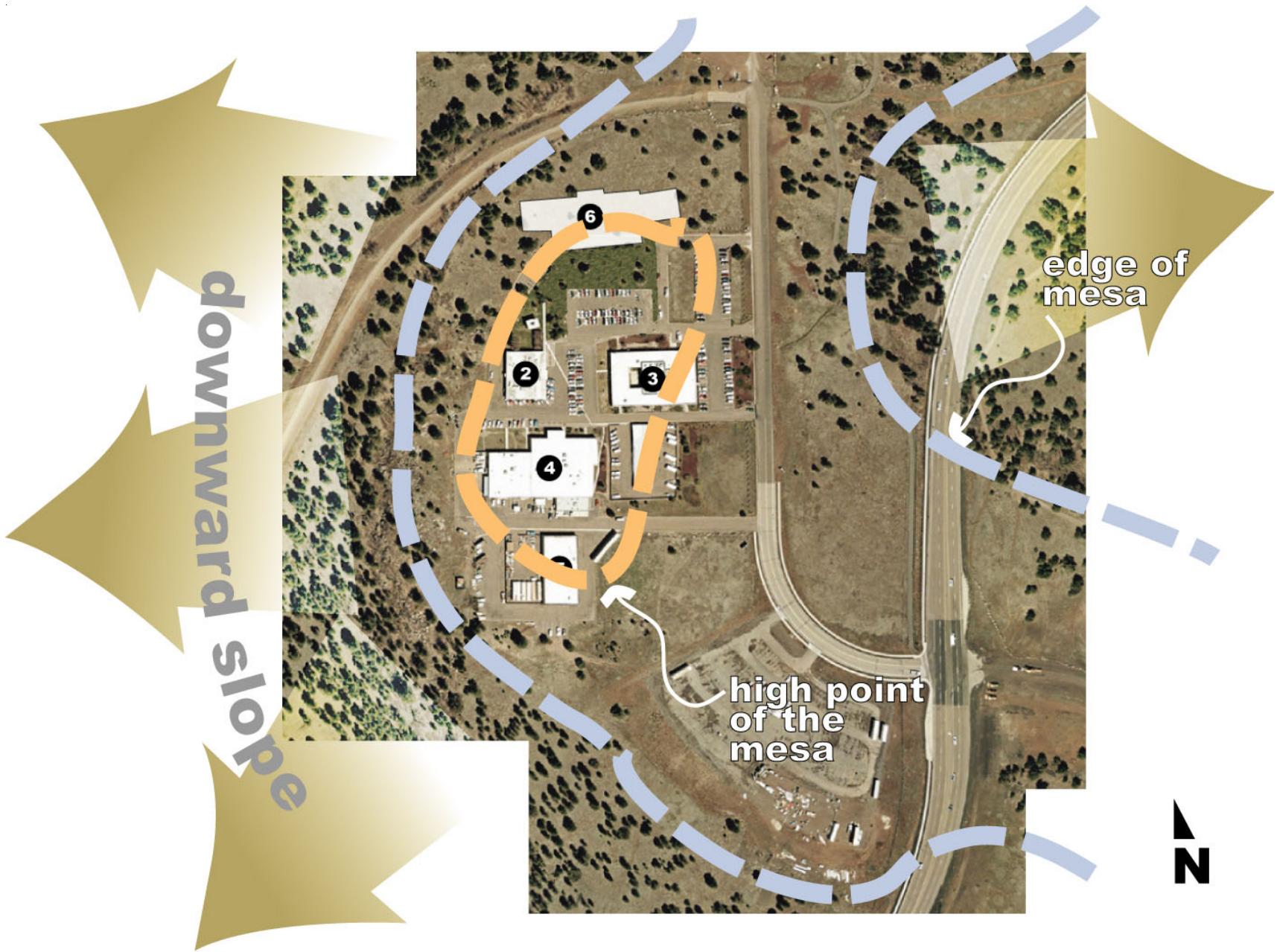
context



- Vehicle compound
- Building 2
- Building 3
- Building 4
- Building 5 - warehouse
- Building 6
- Buffalo Park
- off-site Hospital parking
- Survey Control Monument
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

existing
campus





City of Flagstaff

USGS Master Plan

Campus Phased Summary

02/22/04

DEPARTMENT	Existing 2004	Phase 1 2005	Phase 2 2006	Phase 3 2008
Existing Building 2 GSF	8,882	Removed		-
Existing Building 3 GSF	17,982	572		838
Existing Building 4 GSF	29,970	-	Removed	-
Existing Warehouse GSF	11,250	-	Removed	-
Existing Building 6 GSF	27,790	-		4,794
New Laboratory Building GSF	-	9,542		-
New Office Building GSF	-	26,103		-
New Warehouse GSF	-	-	19,930	-
New Welcome Center GSF	-	-		37,836
Total New GSF		35,645	19,930	37,836
Building Renovation GSF		572	-	5,632
Total Construction or Renovation GSF / Phase		36,217	19,930	43,468
Cumulative Total GSF Area / Phase	95,874	122,637	101,347	139,184
% increase of GSF Growth from Existing		128%	106%	145%
Existing Parking		TBD	165	189
New Parking		165	24	24
Cumulative Total Parking		165	189	213

This chart lists the existing square footage of campus buildings by use. Future campus expansion is catagorized as phased construction and type of facility to meet projected growth needs. These areas are set forth as a reference to determine the ultimate physical size of the campus.

Refer to Appendix for a detailed Functional Program.



The Master Plan illustrates the planning recommendations that are based on an understanding of the existing USGS campus patterns. These patterns present problems to resolve as well as assets and opportunities on which to build as well as an understanding of the future science park's development needs and pattern. The design guidelines describe how the various USGS and Science Park campus systems can be influenced to meet the established master plan purpose and goals. These campus systems and the way they relate to one another determine how well the combined campus is organized as well as the way it appears aesthetically.

It is the desire of the Users and Planners to create a campus environment that integrates the Mesa into the Campus development. This new environment would reflect the environmental and sustainable based philosophy of the USGS and the City of Flagstaff. The surrounding hiking/walking trails are tied into the campus pedestrian circulation patterns. The Master Plan intent is to pull the native quality and quantity of the surrounding vegetation into the heart of the campus.

The new buildings will be designed with durable and timeless materials that respect the rigors of the Northern Arizona climate and create an appropriate working environment that offers views and daylight for all occupants. A material palette of light colors in a neutral and warm color range will create a campus that will compliment the earth tones that are prevalent and desired in the Flagstaff area.



- Site Development
- New Construction
- New Parking Areas
- Demo area

PHASE 1

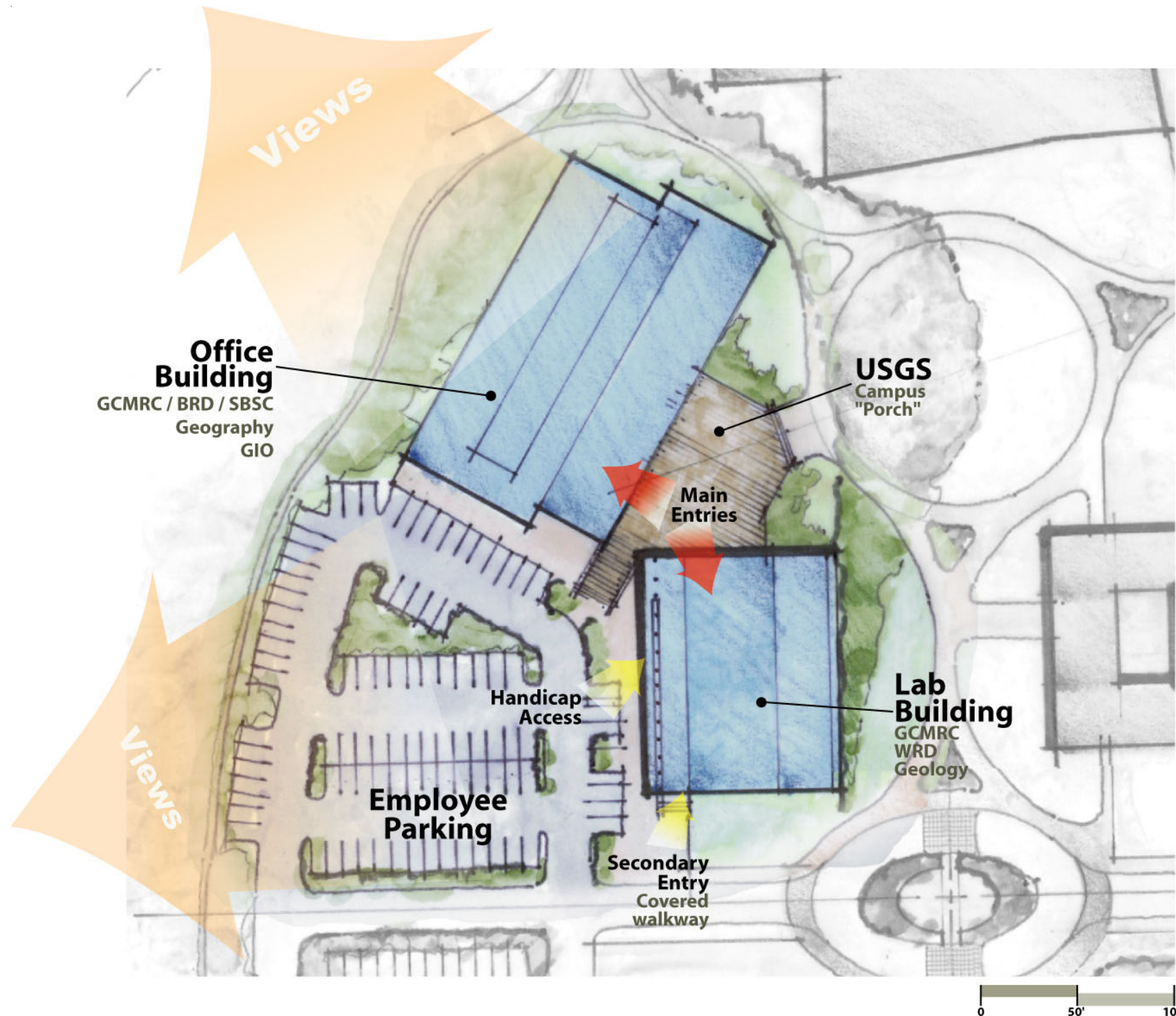
Phase 1 will include the construction of the new Office/ Lab Building (replacement of existing Building 4 functions), minor renovation to building 3, site work that includes parking, pedestrian pathways, site lighting, landscaping and the relocation and upgrade of the site utilities.

PHASE 2

Phase 2 will include the demolition of Building 4 and Building 5 (warehouse) and the construction of the new warehouse and vehicle compound parking. In addition to building construction, the remaining site work on the USGS Campus will be implemented.

PHASE 3

Phase 3 will involve the construction of the new Welcome Center; it's related visitor parking lot and site work, the rehabilitation of the exterior of building 3 and the "backfilling" of building 6's previous library space. The final size of this building will be determined by the amount of space required by the relocation of USGS's Menlo Park library.



Office Building

The Office Building is placed on the site to maximize the views and natural light as well as placing the users in the center of the USGS campus. The inner core of the Office Building layout will be designed to accommodate natural light from the clerestory above. Central to the two buildings is a common outdoor interaction area. This "hub" will provide space for each division's researchers and scientist to meet and interact as well as gather for planned events.

SBSC

Southwest Biological Science Center

GCMRC

Grand Canyon Monitoring & Research Center

WRD

Water Resource Division

GIO

Geographic Information Office

BRD

Biology Resource Division

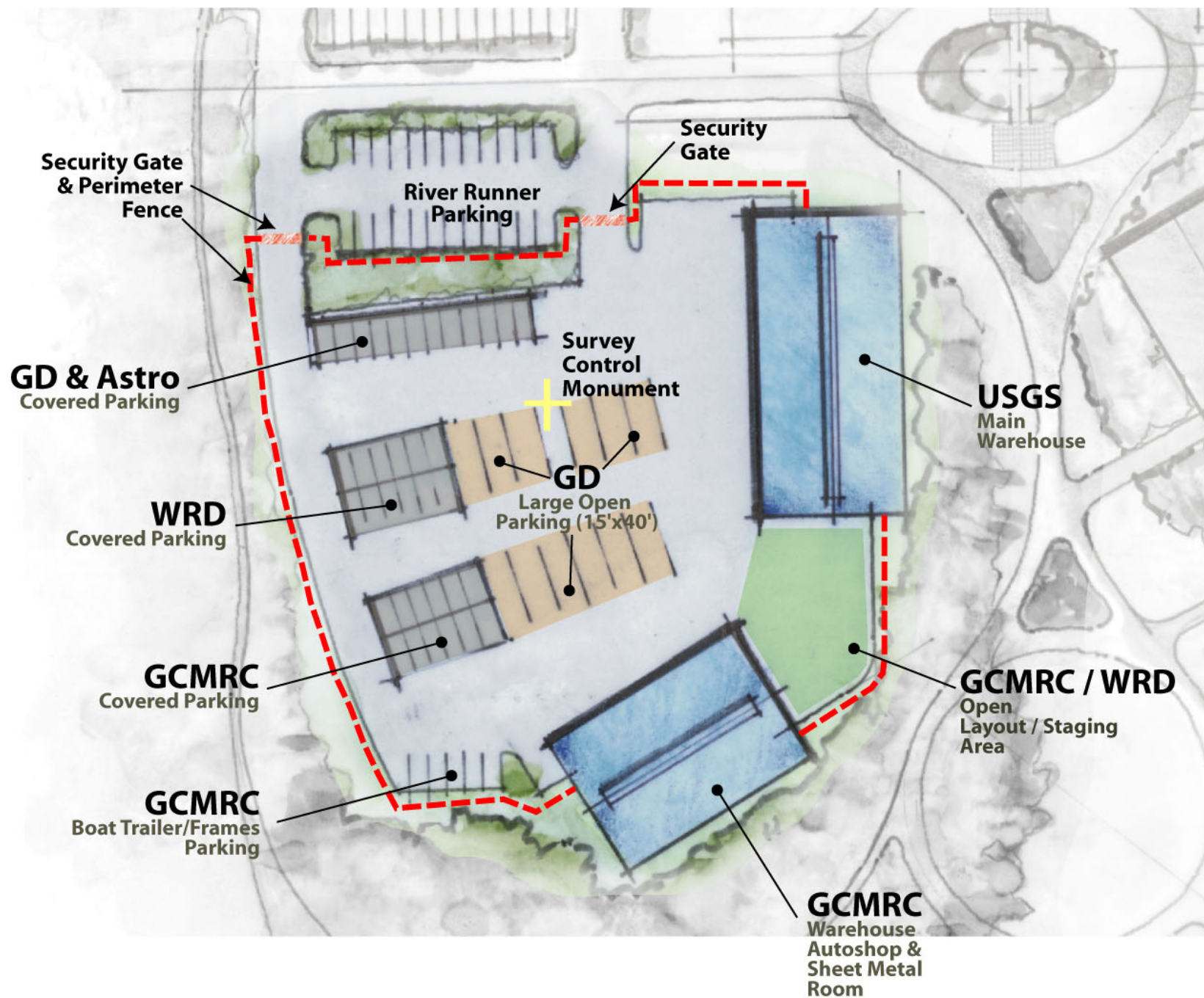
Lab Building

The lab building combines all the different wet and dry laboratory spaces throughout the USGS Campus, creating a safe, efficient and environmentally conscious solution.

The parking lot is located on the "downside" of the Mesa – allowing site-lines, to the west, from the laboratory building to be unobstructed by vehicles.

office & lab building

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Warehouse

The Warehouse component is a crucial part of the Master Plan. It is the most efficient way for USGS to have its materials close at hand, especially during peak times when they are in and out of the campus many times a day. Also, it will allow the transfer of experiments and materials from their trips directly to the new lab building. The Warehouse will incorporate the same architectural character as the rest of the campus. It will have stone and block exterior walls encompassing a functional and economical steel frame warehouse. The warehouse is broken into two separate buildings – one is dedicated to a flexible general storage warehouse, and the second one is dedicated to active storage for the shops and GCMRC activities. A dedicated staging/layout area is allocated for WRD and GCMRC's needs to prepare for their weekly off-site field trips.

Service Yard / Vehicle Compound

The Service yard / Vehicle compound will provide a central and secure location for all of USGS's vehicles, boats, trailers and RVs. This compound will be encircled by a security fence and electrically controlled vehicular gates. The service yard is designed to accommodate deliveries from tractor-trailer trucks, and other box trucks used by delivery companies. The central refuge and recycle bins will be located adjacent to this facility's complex.

GCMRC

Grand Canyon Monitoring & Research Center

WRD

Water Resource Division

GD

Geologic Discipline

Astro

Astrogeology

warehouse complex

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Welcome Center

The Welcome Center will provide a central point for visitors to freely explore and understand the research and studies that the USGS personnel perform on this campus. It will be the main control location for the public and a bridging point to the rest of the campus. The main lobby of the building will become a display area or museum that exhibits posters, fossils, artifacts, and historically significant equipment.

The Library within the Welcome Center will become the central information hub and depository for this and other USGS campuses nationwide. It is the intent of the Master Plan to purposefully locate this building prominently and central to both the USGS campus as well as the Science Park. This space will provide connectivity to the community, as well as interaction opportunities with the USGS staff and scientists and occupants of the Science Park. There will be a separate visitor & bus parking off of Gemini drive for purposes of GSA security requirements of 50' from all federal buildings. The USGS Administration staff and multipurpose conference/training room will also be located within the building.

welcome
center

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Science Park

The development of the Science Park's buildings and site work will complement the philosophy and architectural character of sustainable and environmental design of the USGS Campus.

The locations and heights of the buildings should comply with the general zoning as indicated on the diagram. It is the desire of the City of Flagstaff to have the occupants'

line of work complement the current and future research and efforts set by the staff of the USGS Campus. The quantity of parking and building footprint shall be determined in conjunction with

the City of Flagstaff's development staff. It is the intent of the City of Flagstaff to have the first building in the Science Park to be under construction in 2005

Design Guidelines



Development Patterns

Clear principles for land use organization are needed to establish a basis for coordinating the location of future building facilities (i.e. library, labs, office and administration, parking, etc.). Planning for the future of the USGS campus should build upon existing building patterns where possible. The organization of the USGS campus land uses into logical zones can improve convenience, enhance orientation and improve operational effectiveness. A compact campus with common and shared uses at the center will also enhance opportunities to improve social interaction. The manner in which campus buildings relate to open space, parking, and other buildings also plays an important role in establishing a visible and understandable sense of campus structure at the USGS.

Recommendations:

- Explore development opportunities, which cluster uses such as classrooms, labs, storage, and support space.
- Recognize the importance of the placement of a Library/ Interpretive facility at the USGS campus entrance to interface more with the Flagstaff community.
- Relocate and consolidate the warehouse/ storage facility along the western edge of the site.
- Concentrate the proposed Science Park in the southern portion of the site.

- Maintain the existing Building No. 3 on campus.
- Replace Building No. 2 with additional lab and office space.

Open Space

When treated as an integrated system, open space can create a powerful organizing element, which can serve as a basis for locating and orienting buildings. Open space can enhance visitor orientation by making the overall structure of the USGS campus more understandable. The location and design of open spaces can also create a unifying visual matrix that can help to blend architecture on campus. Open space treatments or landscaping at the USGS campus perimeter, along roadways and entrances, help to establish a positive identity for the USGS campus. A variety of open space types, whether hard or soft surfaced, are included in the open space system for the USGS campus.

Recommendations:

- Establish a series of open space opportunities (plazas, building entrances, etc.) that will facilitate large as well as small numbers of users on campus. These spaces will provide increased opportunities for staff and visitor interaction on the USGS campus.
- Begin to develop a campus landscape, which better reflects the area adjacent and surrounding the USGS campus. This landscape treatment will demonstrate the

USGS and the City of Flagstaff's commitment to an environmentally responsible and sustainable approach to campus landscape improvements.

- Begin to identify and develop locations and opportunities for including interpretive displays and public art on the USGS campus. Placement of these pieces should be in highly visible areas and should be flexible enough that opportunities to rotate pieces remain an option.
- Continue taking advantage of the park-like buffer that exists around the perimeter of the USGS campus.
- Recognize the importance of the Mesa, both in view shed analysis and impact on the landscape. This area has public, park and wildlife trails that should be preserved and enhanced.

Pedestrian Circulation

A well-designed pedestrian walkway system can help to bring order to the USGS campus. Safety, convenience and order can be significantly enhanced if direct and clearly defined walkway connections are established between campus buildings and parking. The walking distance between campus functions is a critical measure of the organizational effectiveness of a campus environment.

On the USGS campus, the pedestrian has a clear priority, which results in a safer and more attractive environment. Parking lots will begin

Design Guidelines (cont.)

to be located at the perimeter of the USGS campus.

Recommendations:

- Begin the development of an internal pedestrian circulation walkway system that minimizes the number of instances where a pedestrian must encounter a vehicle accessing the USGS campus and related parking.
- Develop a walkway hierarchy that recognizes and reinforces the number of staff and visitors moving between various campus locations.
- Provide for a safe, efficient and convenient means of getting from the parking areas to the pedestrian core of the USGS campus. Improvements to consider include adequate sidewalk widths, appropriate landscaping and

lighting, and provide ample width for service vehicles where required.

- Continue to develop safe and convenient linkages to existing trails systems that originate within Buffalo Park and link to the surrounding Flagstaff community. In addition, provisions for sidewalks, and bus stop connections are incorporated into the Master Plan which specifically address access from Gemini Drive.

Vehicular Circulation

The traffic patterns of the USGS campus are directly linked to the fabric of the Flagstaff community. Problems generated by one have a direct impact on the other. Therefore, consideration was given to the impact that USGS campus development will have on the surrounding community. Where streets define the edge of the USGS campus, opportunities to

improve the visibility to visitors and to improve access have been identified. In the same respect, consideration should be given to maintaining the natural vistas from the pedestrian and vehicular approach to the site. The opportunity to reroute the internal campus traffic will allow for a higher quality pedestrian environment to be achieved. The continued positioning of parking around the perimeter will capture the majority of the vehicular traffic.

Recommendations:

- Within the core of the USGS campus where activity is greatest, vehicular traffic will be more the most part eliminated and service traffic will be carefully controlled. The enforcement of this circulation concept will ensure a pedestrian friendly environment for staff and visitors to the USGS campus.
- Provide sufficient visual buffers that blend distant vistas with approach views. (see image on this page)
- Two entrances to the USGS campus will be developed. Both of these campus entrances will be located off Gemini Drive. The southern most entrance will serve the proposed Science and Research Park. The northern entrance will provide an appropriate arrival to the USGS portion of the campus. Both entrances will provide access to adequate parking.
- Implement measures for traffic calming that will reduce the speed with which individuals move through the USGS



Approach Buffer

Views should not block distant views of the mountains, but also allow subtle glimpses of the new development. Provide sufficient visual buffer using existing and new landscaping as well as incorporating the existing topography.

Design Guidelines (cont.)

campus. The introduction of changes in paving materials, broader and bolder crosswalks, concentrated landscaping, and minimized pavement widths will all contribute to reductions in the speed of motorized vehicles on the USGS campus.

- Implement a new traffic signal at Gemini and Forest/Cedar should be installed to improve safe access to the site for both USGS users and the public users of Buffalo Park

Parking

Parking continues to be essential to the functioning of the USGS campus and, therefore, has been coordinated with the planning for vehicular and pedestrian circulation as well as land use organization. It must be adequate in terms of supply and within a convenient walking distance.

Recommendations:

- Begin to remove surface parking from the interior of the USGS campus and relocate these spaces to the perimeter of the site.
- Begin to explore opportunities within the Flagstaff and USGS community that take advantage of mass transit, carpooling, flextime, etc.
- Maintain appropriate separation between the Science and Research Park and the USGS campus. Appropriate security measures necessary at the USGS campus require that this separation be enforceable and flexible.

Retention

Retention requirements for the development of the USGS campus are an environmental need for the site and will have to be coordinated with the planning of the proposed build out. It must be adequate in terms of capacity and must complement considerations being made with regard to storm water management.

Recommendations:

- Minimize the amount of runoff on the site by reducing the amount of hard surface area across the campus (i.e. parking lots, drives, walkways, etc.)
- Locate retention areas in locations on the USGS campus where they are least visible or implemented and treated as site amenities and contribute to the overall aesthetics of the campus.
- Any problems that exist regarding drainage should be corrected before or during early phases of site improvements to prevent future problems with drainage. All future site work on the USGS campus should include a full evaluation of the site drainage and drainage design should be included.

Service and Utilities

The convenience, appearance and overall quality of the USGS campus are influenced by the location of existing utilities and proposed service points and routes. Certain uses, particularly the Warehouse Building, have

special service requirements. Likewise, a well-planned utility system is important to ensure that the USGS campus is able to perform its functions without interruptions.

Recommendations:

- Concentrate the service requirements for existing and proposed facilities on the USGS campus wherever possible.
- Locate the new Warehouse facility along the western edge of the site and consolidate the outdoor storage/service requirements in order in to minimize their visibility.

Landscape Palette

Conifers

- *Abies concolor* – White Fir
- *Juniperus scopulorum* – Rocky Mountain Juniper
- *Pinus ponderosa* – Ponderosa Pine
- *Pseudtsuga menziesii* –Douglas Fir

Canopy Trees

- *Populus tremuloides* – Quaking Aspen
- *Quercus gambelii* – Gambel’s Oak

Ornamental Trees

- *Acer glabrum* – Rocky Mountain Maple
- *Robinia neomexicana* – New Mexico Locust
- *Sorbus scopulina* – Mountain Ash

Shrubs

- *Juniperus communis* – Common Juniper
- *Symphocarpus longiflorus* – Snowberry

Design Guidelines (cont.)

- *Rhus glabra* – Smooth Sumac
- *Rosa woodsii* – Woods Rose
- *Mahonia repens* – Creeping Mahonia
- *Potentilla fruticosa* – Shrubby Cinquefoil
- *Physocarpus monogymus* – Mountain Ninebark
- *Ribes cereum* – Skunkbush
- *Ceanothus fendleri* – Fendler’s Buckbrush

Perennials

- *Achillea millefolium* – Common Yarrow
- *Delphinium geraniifolia* – Larkspur
- *Lupinus argenteus* - Silver Lupine
- *Asclepias tuberosa* - Butterfly Weed
- *Antennaria parvifolia* - Rocky Mountain Pussytoes

Grasses

- *Poa fendleriana* – Mutton Grass
- *Boutelona gracilis* - Blue Grama
- *Muhlenbergia montana* – Mountain Muhly
- *Elymus trachycaulus* – Slender Wheatgrass
- *Festuca arizonica* – Arizona Fescue

Site Signage

- A hierarchy of signage should be implemented across the USGS campus. Signage types should include entrance, building, directional, and regulatory sign types.
- Ensure that the design, color, and style of the signs used, are consistently located throughout the USGS campus and that they compliment the architectural character being recommended.

- Locate campus signs in highly visible areas, however, minimize the number of signs placed on campus in order to reduce the visual clutter they might create.

Area Lighting for Streets & Parking Lots

- Use lighting design to help articulate campus USGS campus traffic for both orientation and safety.
- Select units that are simple and unobtrusive – standard in style, color, height, diameter, and location.
- Choose luminaire design that minimizes light pollution.
- Control lighting distribution to optimize intensity, ensure uniformity of illumination, and minimize glare.
- Ensure that light quality of selected area lights remain unaffected in inclement weather.
- Promote the use of energy efficient light sources and alternate energy (for example, solar power) where feasible.

Pedestrian Lighting

- Select lighting on the USGS campus to be consistent with the character of the architecture being proposed for new facilities.

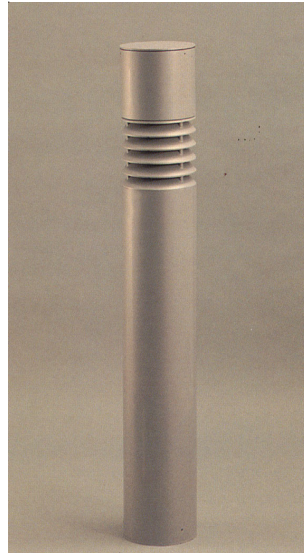


- Provide lighting that concentrates lighting downward from the light source so that lighting provided is in compliance with the dark sky lighting ordinance that exists for the City of Flagstaff.
- Locate pedestrian lighting in strategic locations to enhance pedestrian safety and security.

Bollards

- Two types of standard bollards are recommended, both decorative and utilitarian, based on durability, and ability to withstand vehicular impacts.

Design Guidelines (cont.)



- Bollards should be consistent in design with selected site furnishings and styles for highly visible areas. Bollards should also compliment the architectural character being recommended.
- Install bollards to allow for easy replacement with minimal disruption/damage to the surrounding surface materials.

Seat-Walls, Walls and Benches

- Introduce seating areas on the USGS campus to incorporate a combination of varying lengths of seat-walls alongside benches in order to encourage varying types of uses.
- Locate seat-walls in varying locations so that seasonal changes can be addressed (i.e. in the shade for



summer use, in sunny areas for winter uses).

- Configure benches in select areas on the USGS campus – typically concentrated in gathering spaces, such as pedestrian plazas and building entrances, to encourage and facilitate interaction among staff and visitors.
- Ensure the design, color, and material of the benches to be consistent with other site furnishings. Native stone in combination with concrete would be appropriate for the set-walls. Metal benches, or benches made of recycled material, is recommended.

Waste Receptacles/ Ash Urns

- Use a standard waste receptacles and ash urns consistently across the USGS campus.
- Locate waste receptacles and ash urns where needed, especially in areas with high volumes of pedestrian traffic, but to allow easy trash collection.
- Ensure that all waste receptacles and ash urns remain visually inconspicuous.



Design Guidelines (cont.)

LEED Certification Considerations

Sustainable sites

- Develop an erosion and sediment control plan that conforms either to the EPA's Storm Water Management for Construction Activities document OR local standards, whichever is more stringent.
- Site Selection. Avoid development in sites such as endangered species habitat, wetlands, and public parkland.
- Opportunities for rainwater harvesting should be researched, developed and incorporated. (see image on following page)
- Alternative Transportation. Locate buildings near public transportation, providing bicycle parking, installing alternative refueling stations, minimizing parking lot size and offering preferred parking for carpools.
- Reduced Site Disturbance. Restoring 50 percent of the remaining open area on previously developed sites by planting native or adaptive vegetation.
- Reduced Site Disturbance. Reducing the development footprint to exceed local zoning's open space requirement for the site by 25 percent.
- Storm Water Management. Installing a storm water treatment plan that:

generates no net increase in the rate and quantity of storm water runoff or a 25 percent decrease if existing imperviousness is greater than 50 percent and conforms to EPA guidelines for reducing non-point source pollution.

- Landscape and Exterior Design to Reduce Heat Islands. Increasing shade or using light-colored materials on 30 percent of non-roof impervious surfaces; or placing 50 percent of parking underground or using an open grid pavement system.
- Light Pollution Reduction. Installing low outdoor lighting levels and ensuring that zero direct-beam illumination leaves the building site.

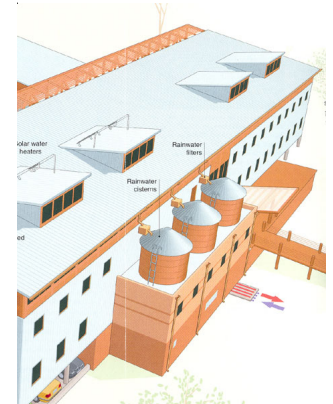
Water Efficiency

- Water Efficient Landscaping. Using high efficiency irrigation technology or reducing irrigation with potable water by 50 percent by using captured rain or recycled site water OR using only captured rain or recycled site water for irrigation, OR not installing permanent landscape irrigation.
- Innovative Wastewater Technologies. Reducing the use municipally-provided potable water for building sewage conveyance by 50 percent OR treating 100 percent of wastewater on site to tertiary standards. Potential incorporation of existing access to reclaimed water on site since there is proximity to an existing tank next to the site

Materials and Resources

- Construction Waste Management. Developing and implementing a waste management plan that recycles and/or salvages at least 50 percent (by weight) or construction, demolition and land clearing waste. Recycling or salvaging an additional 25 percent (75 percent of total).
- Recycled Content. Reducing the extraction of new materials by specifying a minimum of 25 percent of building materials with post-consumer or industrial recycled content, and specifying 50 percent materials with recycled content.
- Local/Regional Materials. Reducing the environmental impact of transportation and supporting local economies by specifying that at least 20 percent of building materials be manufactured within 500 miles and specifying that at least 50 percent of these materials be extracted, harvested or recovered within 500 miles.
- Rapidly Renewable Materials. Reducing the depletion of raw and long-cycle renewable materials by specifying at least 5 percent rapidly renewable building materials.
- Certified Wood. Encouraging sustainable forestry practices by using at least 50 percent certified wood, where wood is used.

**Philip Merrill
Environmental Center**
Chesapeake Bay
Foundation
SmithGroup



site
design
guidelines

Design Guidelines (cont.)

architecture

The Design Guidelines are intended to provide a set of planning and development goals that will bring a cohesive architectural character to the campus as new buildings are implemented. The USGS / Science Park campus will be based on a set of common values of building massing, scale, color, materials and articulation in response to the environment, which will also accommodate individuality based on program requirements.

Building Design

New buildings should take into consideration the use of durable and timeless materials, in conjunction with a conscious effort to design office / laboratory / warehouse / public buildings that respect the rigors of the Northern Arizona climate and creates an appropriate working environment that offers views and daylight for all occupants.

A consistent palette of color and building materials can greatly contribute to a cohesive campus image while allowing for more freedom in building articulation and design elements. A materials palette of light colors in a neutral and warm color range will create a campus that will compliment the earth tones that are prevalent and desired in the Flagstaff area.

The intent of these Design Guidelines is to create a framework for design that will result in a consistent campus that is both livable for the building occupants and a good community citizen.

Building Heights and massing

General massing will be 1 story with exception to the Welcome Center, which may develop into a 2 story space with the addition of Menlo Park. The Science Park campus will integrate 1 story massing consistent with the USGS campus and interlace in 2 story volumes at key locations that will not interfere with views.

Required Building Setbacks

All new construction will recognize the City of Flagstaff zoning codes for the PL-O District, as well as all required specifications indicated by GSA.

Durable materials

The use of durable natural or man-made materials with a minimum life span of 50 years is encouraged. This longevity expectation will promote quality materials and discourage the use of high life-cycle materials such as synthetic exterior finish systems. Materials such as indigenous stone, wood, block and metal roofing will provide the basis for the architectural palate for the campus.

Transparency

Transparency of the glazing system will promote a safe and open campus environment with views into and out of the facility as well as bring in the natural environment into the work environment. Insulated, Low E glazing will be used as a standard for the campus.

Building Entries

Articulate the primary building entrances at both the street frontage and at the internal pedestrian malls with protective canopies or voids in the building envelop. Building lobbies should create a sense of entry with spatial volume.

Building Fenestration

Articulate different internal programmatic space on the exterior of the building with the amount of transparency or solidity of the fenestration. Material change can also be utilized to reflect a change in function.

Solar Orientation

The building fenestration should address the specific solar orientation and respond with overhangs and shading devices that will mitigate sun penetration into occupied spaces.

Scale and Massing

New buildings should address the pedestrian scale at the ground plane by incorporating elements that encourage human interaction with the built environment. Seat walls, street furniture, shade and sunny areas that invite people to enjoy the climate of Northern Arizona and create a sense of interaction.

Design Guidelines (cont.)

Color

Colors and building materials are influential in conveying a sense of community within the USGS campus / Science park. A palette of materials has been selected that will distinguish the visionary research that is the mission of this campus. There is a confluence on this campus of different aspects of public and private development, research and education, and multi-disciplinary investigations that should be celebrated in the built form; there also needs to be a collective set of values that guide future construction to address sustainability, quality of materials, and appropriate design that is supportive of intellectual exchange.



Tone

Tones of brown, grays, silver and very light earth tones will project a warm and inviting feel with a contemporary image. The hardscape materials at the ground plane should be the richest color palette of natural materials and earth tones that together with the plant materials bring vibrant color to the environment. Gateways and building entrances should use the color of natural materials to signify arrival.



Materials

Locally produced products that are sustainable in raw materials, manufacturing and transportation are encouraged. Glazing should be transparent, energy efficient and non-reflective. Transparency to enliven building facades and to promote an open and safe pedestrian campus is preferred over opaque wall materials.



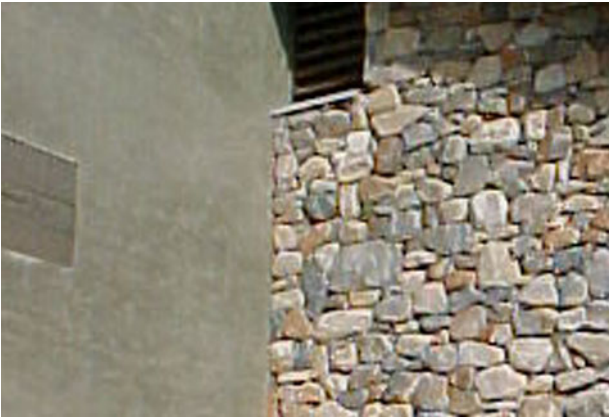
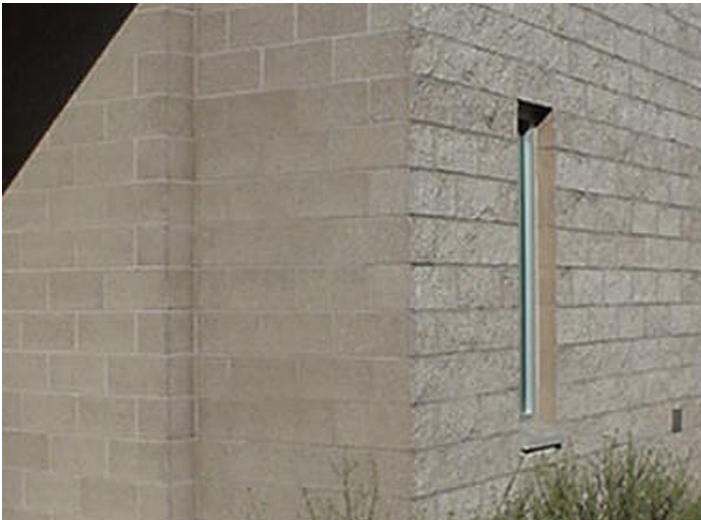
Design Guidelines (cont.)

Primary Building materials

- Wood
- Local Natural Stone
- Low-E Transparent Glass
- Metal
- Cast-in-place Concrete
- Sloped Metal Roofs

Secondary Building Materials

- Ground-faced integrally colored masonry units
- Paving stone, Masonry Pavers or Ground/Sandblasted Concrete



Design Guidelines (cont.)

Utilities

Mechanical Design Objective

The campus master plan should focus on two main objectives, to provide the City of Flagstaff / USGS with an infrastructure capable of supporting the phased redevelopment of the site, and provide buildings that meet the users current program needs. New buildings should be environmentally friendly, energy efficient and easily maintainable.

Codes and Standards

The latest revision of the following codes and standards will be used as references for the mechanical design:

- Uniform Building Code (2000 UBC)
- Uniform Plumbing Code (1997 UPC)
- Uniform Fire Code (2000 UFC)
- Uniform Mechanical Code (2000 UMC)
- American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Handbooks
- American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code
- American Society for Testing and Materials (ASTM)
- American National Standards Institute (ANSI)
- Associated Air Balance Council (AABC)
- Environmental Protection Agency (EPA)
- Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
- Occupational Safety and Health Administration (OSHA)
- National Fire Protection Association (NFPA)
- Air Conditioning and Refrigeration Institute (ARI)
- American Water Works Association (AWWA)
- Underwriters' Laboratories (UL)

Environmental Design Conditions

Site:	City of Flagstaff - USGS
	Flagstaff, Arizona
Latitude:	35/13'
Longitude:	111/0'
Elevation:	7,011 ft.

Outdoor Design Temperature

Winter dry bulb:	-2°F
Summer dry bulb:	83°F
Wet bulb:	60°F

Indoor Design Temperature General Network Rooms

Winter dry bulb Temperature:	72°F 68°F + 4°F
Summer dry bulb Temperature:	75°F 68°F + 4°F
Humidity Control:	20% Rh Min. 40 – 50% Rh

Site Infrastructure

(see Phasing sheet)

Building mechanical systems

Heating Systems

Natural gas fired, water tube, heating water boilers will be provided at each building for heat generation. Boilers will be sized for 70% capacity for redundancy. The distribution system will deliver 180 degree heating hot water with a design temperature drop of 40°F to air handling unit-heating coils and terminal unit reheat coils. Each coil will be equipped with a two-way control valve. The distribution pumping system will consist of two variable speed pumps, each designed to provide 100% redundancy of the total flow requirement. Variable frequency drive units will be provided for capacity control and energy savings. Specialty shops and the warehouse buildings will be provided with natural gas fired ventilating units suspended from the structure.

Air Conditioning Systems

Mechanical equipment rooms will be located in each building to minimize noise and vibration. Factory fabricated single duct, variable air volume air-handling units will be provided. The air-handling units will consist of supply and relief fan sections, refrigerant cooling coil, hot water preheating coil, 30% filter section, 65% secondary filter section and utilize an economizer cycle / enthalpy control scheme to provide economical operation. The supply and relief fans will have variable frequency drives for capacity control. Supply air will be distributed through medium pressure ductwork to single duct variable air volume terminal units. Separation of interior and exterior zones

Design Guidelines (cont.)

will be provided for optimum zone control. The system will provide ventilation and air conditioning for occupant comfort and an outdoor air ventilation rate of 20 cfm per person. Supply air, return air, relief air and outside air will be ducted directly to the air-handling units. Supply and Return air ductwork will be extended through the building to serve each zone. Condensing units will be placed on-site in an enclosed area to control visual, noise and security issues. Building 5 will be provided with natural gas fired heating and ventilating units for winter heating only. Telecom and Network equipment rooms with 24-hour internal heat gains will be provided with ceiling mounted, self-contained, DX, computer room style fan-coil units.

The air distribution system will be constructed of galvanized sheet metal, rectangular, round or oval ductwork per SMACNA standards. In general, the HVAC system will be designed to maintain an acoustic Noise Criteria of 35 NC in occupied spaces.

Exhaust Systems

An exhaust system to serve toilet, janitor and lounge rooms will be provided at each building. These systems will be designed to maintain a negative space pressure at a minimum rate of 15 air changes per hour. Transfer air will be utilized for make up air into the restrooms to prevent over cooling or excessive reheat. Toilet exhaust will be collected and exhausted with roof mounted exhaust fans.

Specialty exhaust will be collected and exhausted through a separate utility vent set and discharge stack located on the roof. This will include fume hoods, geology hoods and welding hoods. An existing dust collector for the wood shop will be relocated and ducted to the new equipment locations.

Energy Management And Control System

The existing City of Flagstaff / USGS building 6 utilizes a Barber Coleman / Siebe energy management and direct digital control system to monitor and control building systems. New buildings will be connected to the existing system to provide one EMCS control location. Building control will be achieved through direct digital electronic controllers and monitored through a LAN network at the existing operating station. The direct digital control system will provide precise temperature control and make smart operational decisions, while providing energy and operating cost savings over conventional systems. Control system strategies will be developed to maximize the energy effectiveness and proper maintenance of the building systems. Control strategies for the air handling systems will include system start-stop, supply air static control, return air static control, morning warm-up mode, economy cycle, air conditioning, heating and maintenance routines.

Building Plumbing systems

Fixtures

Where required by the building design, fixtures will meet the American Disabilities Act (A.D.A.) for accessibility. Water closets and urinals will be vitreous china, wall hung for ease of maintenance. Low flow electric flush valves will be provided for water closets and urinals. Lavatories will be wall or counter mounted with electric sensors as required by programming. Janitors closets will be provided with a floor mounted service sink with hot and cold water. Drinking fountains will be dual receptor and be centrally located near the restrooms.

Domestic Water

Potable cold water will be provided from the site water distribution system and extended to each buildings through a reduced pressure backflow preventer. Hot and cold water will be extended to all plumbing fixtures, non-freeze hose bibbs or outlets to satisfy the programming requirements. The domestic hot water will be provided by an electric water heater and will include a hot water recirculating pump to maintain hot water in the system at all times.

Sanitary Sewer

A sanitary sewer system will extend from all plumbing fixtures, floor drains and equipment drains, and be collected in a properly sized and vented building drainage system. Laboratory

Design Guidelines (cont.)

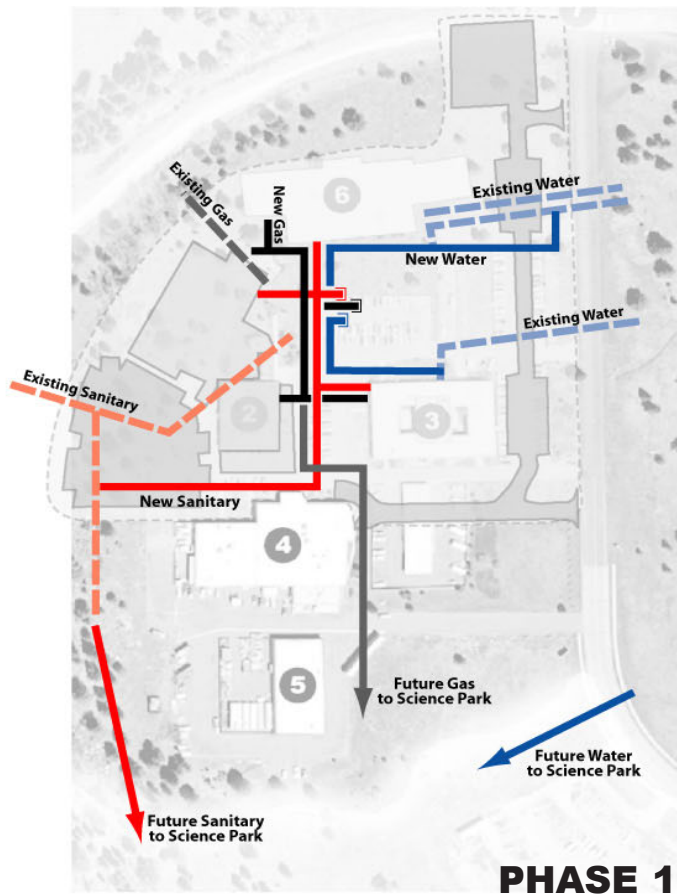
waste drains will be provided with localized acid neutralization tanks prior to connecting to the sanitary system. Sediment drains will be provided for the Geology rooms or where indicated by building programming.

Storm Drains

Roof drains will be sized to handle a rainfall rate of 3" per hour. The building storm drainage system will collect all roofs and overflow drains and extend by gravity flow, to the site. Roof and overflow drains will be provided with electrical heat trace tape to prevent snow and ice buildup.

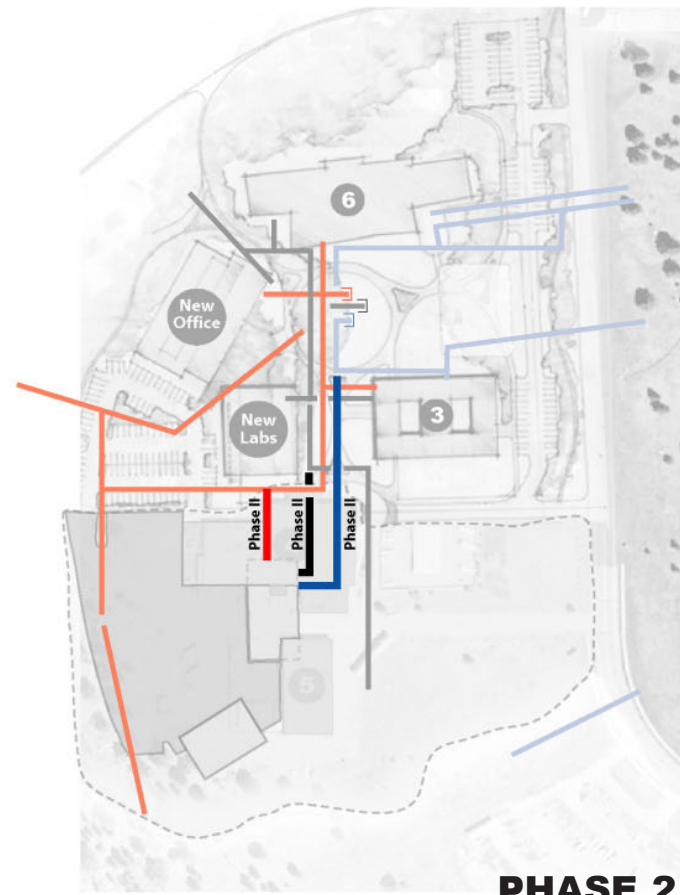
Building Fire Protection Systems

The new City of Flagstaff / USGS buildings will be protected by hydraulically designed automatic sprinkler systems that conform to NFPA 13 requirements for light hazard. Special lab areas will be reviewed for different densities. Fire suppression water will be extended from the site water main through appropriate back flow prevention device to the building fire risers. The building fire riser will be provided with an alarm control valve with a flow and tamper switch and tied to the building fire alarm system. Sprinkler heads will be pendant and upright types to match the space requirements. The Network Room and the PBX Room located in Building 4 will be provided with and inert gas or FM200 fire suppression system.

**PHASE 1**

Sanitary

The existing sanitary sewer currently enters the site from the west near Building 2. From this point, it splits south to serve Buildings 4 and 5, and continues east to serve Buildings 2, 3 and 6. With the Phase I addition to the site (Buildings 4 and 5), the existing sanitary sewer will need to be rerouted from beneath the new Building 4 location. A new 6" sanitary sewer will be connected to the existing south system in-between Buildings 4 and 5, and run east in the center of the campus and extend north through the campus to building 6, and south to Building 5. The existing sanitary sewers for Buildings 3 and 6 can be connected to the system initially with minimal interruption. This new alignment would allow the Phase I (Buildings 4 & 5), Phase II (Welcome Center), and the future building to be supported from this same system.

**PHASE 2**

Water

The site currently has two existing water connections to the street, one near Building 6 and one near Building 3. The existing water service at Building 6 extends west and serves Building 2. The existing water service near Building 3 extends to the center of the campus, turns south and serves Buildings 3, 4 and 5. Revisions to the water service near building 6 will need to be verified. The existing water extensions currently do not appear to be connected together. Two new 6" water connections to the street will extend into the site, one near Building 6 and one near the Welcome Center. This new loop system will extend west to the center of the campus, and extend north and south dissecting the center of the campus. This new loop water system will provide domestic water and fire riser connections to

**PHASE 3**

each building, while satisfying site fire hydrant requirements. Individual water meters will be provided for each building.

Gas

The existing natural gas enters the site at the northwest of the campus near Building 6, and currently serves Buildings 2, 3 and 6. Buildings 4 and 5 are currently served by stand-alone propane tanks at each building. The existing gas

Design Guidelines (cont.)

Electrical Design

Site Utilites (see phasing sheet)

Site Lighting

Site lighting will be limited in and around the site due to light pollution restrictions and dark sky ordinances within the City of Flagstaff. The lighting will be automatically controlled by both photocell and astronomical time clock, and will have the capability of interfacing with the building management system (BMS). Low-pressure sodium lamps will be used in accordance with local ordinances.

Grounding

All buildings will be grounded per NEC 250. A NEC sized copper ground cable will be installed in the foundation to serve as the service grounding electrode. The grounding electrode will be connected to the building steel columns. All grounding system connections will be exothermically welded.

A ground bus will be provided in the MDF room and each IDF room. Each IDF bus will be connected to the MDF ground bus via a dedicated cable. The MDF ground bus will be bonded to the electrical service ground.

Equipment grounding conductors will be provided with each circuit.

Lightning Protection

Lightning protection will be provided at each building. Down conductors will not penetrate the roof, but will be routed as not to interfere with the architecture. The down conductors will terminate at a #3/0 copper ground ring around the building, 4'-0" from the edge of the foundation.

Copper-clad ground rods will be provided and bonded to the ground ring at 20'-0" on center. The ground ring will also be connected to the service ground in the foundation.

Power

Panelboard with isolated ground busses and transformers that manage or eliminate harmonic distortion will be provided to serve sensitive electronic loads in the offices and information technology areas. The use of uninterruptible power sources (UPS) will be limited to the user level for servers and similar equipment.

Load Calculations:

Office Building (23780 s.f.)
Lighting @ 2 VA/s.f X 1.25% = 59.5 KVA
Power @ 5 VA/s.f. = 118.9 KVA
HVAC @ 8 VA/s.f. = 190.2 KVA
=368.6KVA
(1024A @208V-3ph)

Proposed Electrical Service size: 1600A-120/208V-3ph-4W

Lab Building (9542 s.f.)
Lighting @ 2.5 VA/s.f X 1.25% = 29.8 KVA
Power @ 7 VA/s.f. = 66.8 KVA
HVAC @ 9 VA/s.f. = 85.9 KVA
= 185.2 KVA
(507A @208V-3ph)

Proposed Electrical Service size: 800A-120/208V-3ph-4W

Warehouse (19786 s.f.)
Lighting @ 1.5 VA/s.f X 1.25% = 37.1 KVA
Power @ 1.5 VA/s.f. = 29.7 KVA
HVAC @ 1 VA/s.f. = 19.8 KVA
= 86.6 KVA
(104A @208V-3ph)

Proposed Electrical Service size: 225A-120/208V-3ph-4W

Welcome Center (37382 s.f.)
Lighting @ 3 VA/s.f X 1.25% = 140.2 KVA
Power @ 4 VA/s.f. = 149.5 KVA
HVAC @ 2 VA/s.f. = 74.8 KVA
= 364.5 KVA
(1636A @208V-3ph)

Proposed Electrical Service size: 2000A-120/208V-3ph-4W

Design Guidelines (cont.)

Lighting

Interior lighting will be provided to meet IES recommended levels and to provide a flexible and visually comfortable working environment.

Lighting for offices will be primarily 2'-0" x 4'-0" lay-in type fixtures with 18 cell parabolic louvers with 4'-0" T8 fluorescent lamps and energy efficient electronic ballasts. Down lights with compact fluorescent lamps will be used in public spaces. An effort will be made to maximize day lighting in the new buildings to reduce power consumption. Multilevel switching will be used in the offices, labs and conference rooms to further conserve energy and promote increased lamp life. Incandescent lighting will be limited to accent and display lighting in order to achieve further energy efficiency.

Light fixtures will be supported independently of the ceiling grid and will be provided with earthquake clips.

Voice / Data

A main distribution frame (MDF) and telephone backboard will be provided in each building in a main telecom/server room to serve voice and data requirements. Both multimode fiber optic and twisted pair copper cable will be run to the MDF room and each IDF room. Category 6 cable will be provided for each data outlet and category 5e will be provided for each voice outlet. Cables will be run in conduit from the device to a cable tray, where the conduit will be bonded to the cable tray. Voice and data devices will be installed in separate boxes. As a minimum, outlets shall be provided as follows:

Offices and Conference rooms:

- Provide outlets at (2) locations - (2) data, (1) voice at each location. Offices with two workstations: - Provide outlets at (3) locations
- (2) data, (1) voice at each location

Labs:

- (2) data, (1) voice at each workstation

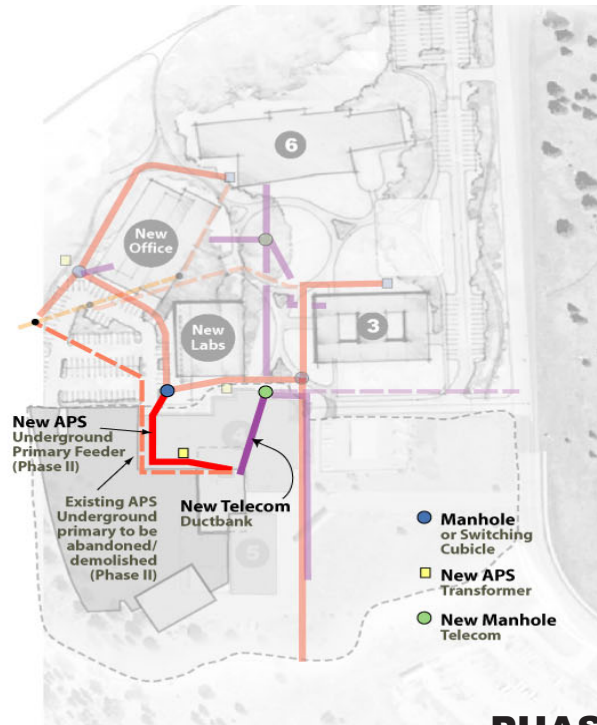
A Campus Backbone cabling system will be provided to connect each building to the Main Server Room. The Main Server room will be located in Building 4. As a minimum, a 24 strand 50 micron multimode fiber optic cable and a 12 strand singlemode fiber optic cable will be run to each building from the Main Server room.

Fire Alarm

A fully addressable and networkable fire alarm system with remote monitoring capabilities will be provided. A Fire Alarm Annunciator Panel will be located at a Building Entrance point determined by the local Fire Marshal. All Buildings will be monitored at this Panel.

Security

Electronic access control will be provided at all exterior doors and at vehicular gates. Specific interior rooms will be protected based on the value of the equipment in each space. An Arm/Disarm station will be located at each building entrance. A keypad will be provided at each server room. Glass Break detectors will be located in each ground level exterior wall office and other selected locations.



The site is served by Arizona Public Service. There are utility meters at Buildings 2, 3, 4 and 6. The existing APS primary feeds overhead from a series of power poles at the northwest side of the property. Building 2 is fed underground from pole-mounted transformers. Buildings 3, 4 and 6 are fed from pole-mounted switches and then underground to pad-mounted transformers. The warehouse is currently subfed from existing Building 4. The Police Communication Building and Tower is also presently served from Building 4.

A new underground distribution system will be provided in phase 1 consisting of underground ductbanks, manholes and concrete pads for APS furnished pad mounted transformers. The distribution system will serve the new Office Building and Lab Building as well as replacement feeders to Buildings 3 and 6. The existing feeder to Building 4

will remain in place. The service feeds to all existing buildings will be installed and reconnected over a weekend and coordinated with the owner to limit minimum downtime.

In Phase 2, the underground distribution installed in phase 1 will be extended to serve the New Warehouses and the Police Communication Building and Tower. In Phase 3, the underground distribution installed in phase 1 will be extended to serve the new Welcome Center.

New ductbanks for APS utility distribution shall consist of (3) 3" C. and (2) 2" C., minimum 42" below grade.

Telecommunications

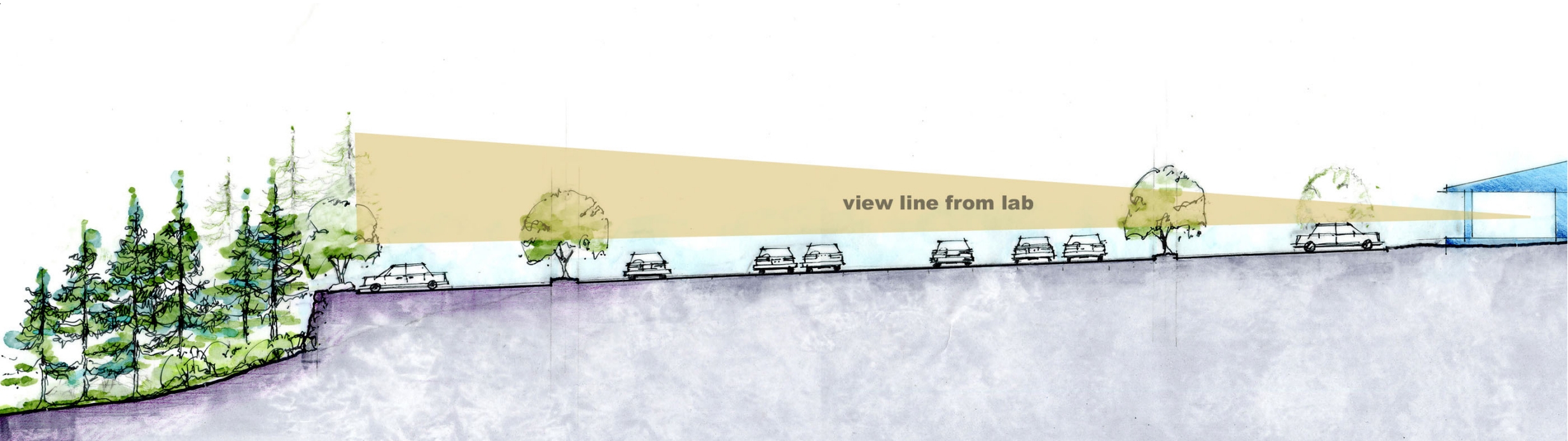
Telephone service is presently provided by Qwest via an overhead line from the northwest side of the property and then underground to a mobile trailer located south of Building 4. The trailer houses a GSA

owned Nortel switch. Telephone service is distributed throughout the campus via underground copper cable. Telecommunications service for data is provided by Qwest from a DS3 fiber optic line underground from the southeast side of the property. The DS3 connection presently terminates in Building 4.

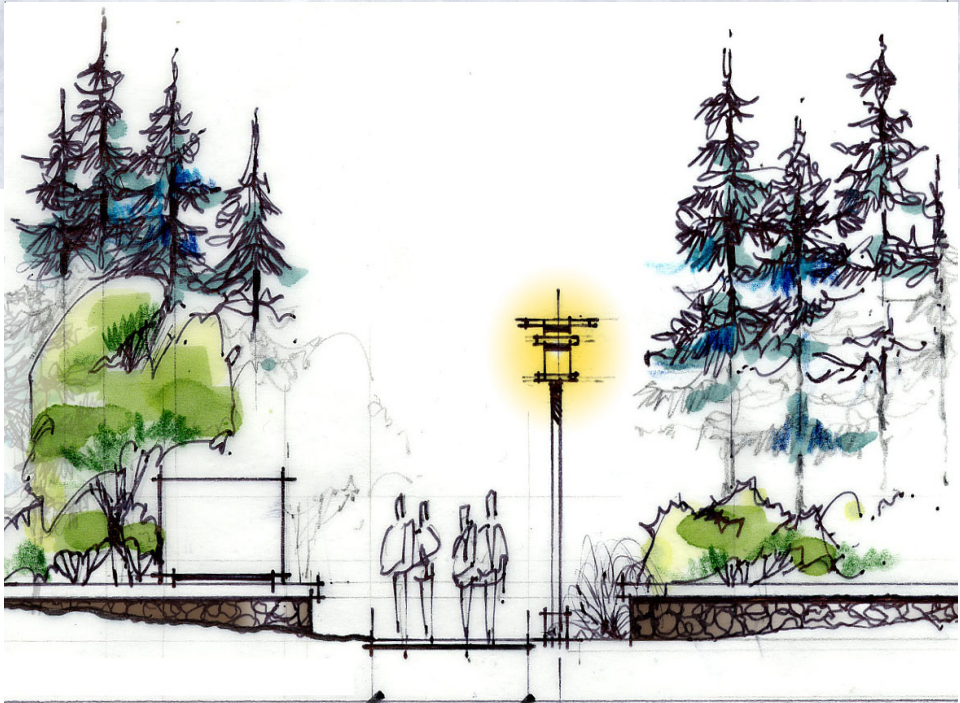
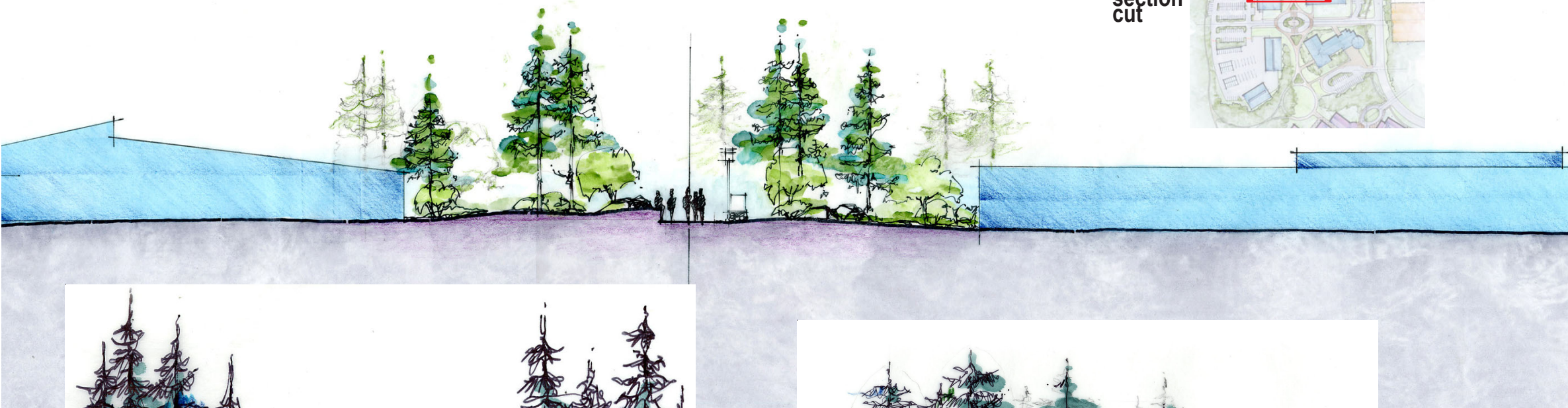
A new Telecommunications room will be provided in Building 2 for the campus Telephone Switch, campus Data Networking equipment, campus Fire Alarm System monitoring and the campus Security System headend equipment. A new underground Special Systems distribution system will be provided in the center of the campus consisting of ductbanks and handholes for Telephone, Data, Fire Alarm and Security Systems. The existing DS3 fiber optic line will be extended to the new Office Building.

sketches
& site sections

City of Flagstaff
USGS
Campus
Master
Plan



section
cut



● path - signage / lighting



● path - signage / lighting / seating

site
sections

section
cut



site
sections

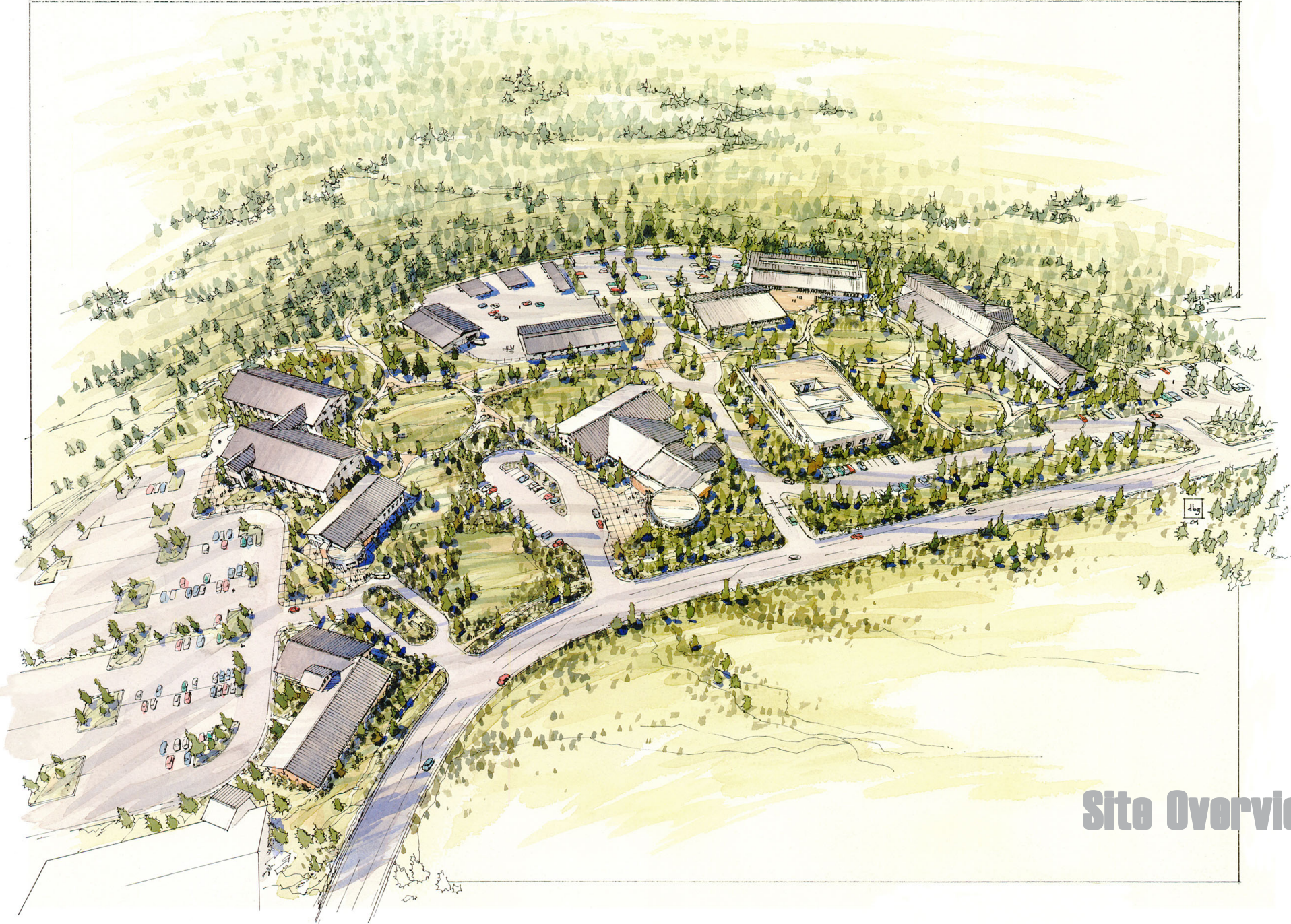
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● path - pedestrian / lighting / vehicle

● site signage

concept
perspectives

City of Flagstaff
USGS
Campus
Master
Plan





concept
perspectives
40

NW View Lab/Office Bldgs



concept
perspectives

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SW View Science Park

appendix

City of Flagstaff
USGS
Campus
Master
Plan

City of Flagstaff

USGS Master Plan

New Laboratory Space Program

02/22/04

CODE	DEPARTMENT	NASF	GASF
A	GEOLOGY: PALEO LAB	580	771
B	WATER SEDIMENT / CHEMISTRY LAB - GCMRC	1,550	2,062
C	BIOLOGY LAB - GCMRC	1,260	1,675
E	WATER RESOURCES LAB	1,195	1,590
F	GENERAL ROCK LAB	600	798
G	COMMON SPACE	250	333
Total NASF		5,435	7,229
GASF to GSF Factor			1.32
Total GSF			9,542

***Note:**GASF: Gross Assignable Square Feet equals NASF plus the area needed for walls and immediate circulation.*

City of Flagstaff

USGS Master Plan

New Laboratory Space Program

02/22/04

Ref Code	Room/Area/Function		TYPE	No. of Rm	Room Siz	NASF	GASF	Fac GASF	Occupant Names/Remarks
GEOLOGY: PALEO LAB									
A	101	Paleo Laboratory	Private	1	500	500	1.33	665	typical office
A	102	Active Storage (part of lab SF space)	Private	1	0	0	1.33	0	
A	103	Tech Office	Private	1	80	80	1.33	106	
A	104	Storage Room	Private	1	0	0	1.33	0	
A	105	Hazardous Storage - Chemical Cabinet - 4'x2'x6'	Private	1	0	0	1.33	0	
Total NASF						580			
Total GASF								771	

Ref Code	Room/Area/Function		TYPE	No. of Rm	Room Siz	NASF	GASF	Fac GASF	Occupant Names/Remarks
WATER SEDIMENT / CHEMISTRY LAB - GCMRC									
B	101	Water Sediment & Water Quality Lab	Private	2	500	1,000	1.33	1,330	
B	102	Storage Room	Private	1	250	250	1.33	333	
B	103	Colter / Balance Equipment Room	Private	1	100	100	1.33	133	
B	104	Oven & Fume Hood Equipment Room	Private	1	100	100	1.33	133	
B	105	Tech Office	Private	1	100	100	1.33	133	
Total NASF						1,550			
Total GASF								2,062	

City of Flagstaff

USGS Master Plan

New Office Building

02/22/04

CODE	DEPARTMENT	NASF	GASF
A	GEOGRAPHY - NMD	2,625	3,492
B	BRD - SBSC GCMRC	9,260	12,112
C	GIO / TELECOM	1,300	1,613
E	SHARED SPACES	2,050	2,558
Total NASF		15,235	19,775
GASF to GSF Factor			1.32
Total GSF			26,103

***Note:**GASF: Gross Assignable Square Feet equals NASF plus the area needed for walls and immediate circulation.*

City of Flagstaff

USGS Master Plan

New Office Building

02/22/04

Ref Code	Room/Area/Function	TYPE	No. of Rm	Room Siz	NASF	GASF	Fac	GASF	Occupant Names/Remarks
GEOGRAPHY - NMD									
A	101	Chief GS 14	Private	1	225	225	1.33	299	Ed P.
A	102	Computer Scientist GS 13	Private	1	150	150	1.33	200	Dennis M
A	103	Computer Scientist GS 14	Private	2	150	300	1.33	399	Alex A, Future
A	104	Computer Scientist GS 15	Private	1	225	225	1.33	299	Pat C.
A	105	Contractor GS 7	Private	1	100	100	1.33	133	Scott K
A	106	IT Specialist GS 12	Private	4	150	600	1.33	798	Jana R., Joann I, Miguel V, Future
A	107	IT Specialist GS 11	Private	1	150	150	1.33	200	Future
A	107	IT Specialist GS 9	Private	2	150	300	1.33	399	David T, , Ryan B Adjacent to Server Room
A	108	Student IT Specialist GS 9	Private	1	100	100	1.33	133	Barry M
A	109	Volunteer's Office	Private	1	100	100	1.33	133	Lenn B
A	110	Plotter	Private	1	225	225	1.33	299	combined plotters (building 3 & 4)
A	111	Equipment Storage Room	Private	1	150	150	1.33	200	
A	112	Server Room (shared server room)	Private	1	0	0	1.33	0	combined computer rooms (building 3 & 4)
Total NASF					2,625				
Total GASF									3,492

Ref Code	Room/Area/Function	TYPE	No. of Rm	Room Siz	NASF	GASF	Fac	GASF	Occupant Names/Remarks
DRB - SBSC ECMRC									
Management Team									
B	101	Program Manager GS 13	Private	3	150	450	1.33	599	Ted Malos, Mike L & Future
B	102	Program Manager GS 12	Private	1	150	150	1.33	200	Helen Fairly
Logistics									
B	103	Logistics Operation Specialist GS 11	Private	1	150	150	1.33	200	Carol F.
B	104	Assistant GS 7	Private	1	100	100	1.33	133	Park S.
B	105	Survey Tech GS 9	Private	2	100	200	1.33	266	Keith K., Kristen B
B	106	Survey Tech GS 11	Private	1	150	150	1.33	200	Mark G.
Ecoscience Science Program									
B	107	Hydrologist GS 12	Private	3	150	450	1.33	599	Scott W, Bill V., Susan H.,
B	108	Biologist GS 11	Private	1	150	150	1.33	200	Mike Yard
B	109	Biologist GS 12	Private	1	150	150	1.33	200	Barb R.

B	110	Fishery Biologist GS 12	Private	1	150	150	1.33	200	Lou C.
B	111	Student Trainee GS 7	Private	1	100	100	1.33	133	Elizabeth F.
B	112	Hydro Tech GS 8	Private	1	100	100	1.33	133	Nick V
B	113	Geographer GS 9	Private	1	100	100	1.33	133	Tom G, Mike B
B	114	Contractor GS 9	Private	1	100	100	1.33	133	Cory L.,, Tim A,
B	115	Oracle Data Base GS 11	Private	1	150	150	1.33	200	Vacant
B	116	USGS Collaborator GS 13	Private	1	150	150	1.33	200	Dave T.
B	117	Vacant GS 13	Private	1	150	150	1.33	200	No Name
B	118	GIS GS 12	Private	1	150	150	1.33	200	Vacant
B	119	Post Docs GS 11	Open	5	150	750	1.25	938	
BRD - SBSC Administration									
B	120	Sr. Executive (Director) GS 15	Private	1	300	300	1.33	399	
B	121	Deputy Director GS 14	Private	1	300	300	1.33	399	
B	122	Admin Officer GS 12	Private	1	150	150	1.33	200	
B	123	Budget Analyst GS 9	Private	2	100	200	1.33	266	
B	124	Accounting Tech GS 7	Private	1	100	100	1.33	133	
B	125	Secretary (Director's) GS 7	Private	1	100	100	1.33	133	
B	126	Admin Assistant GS 5	Open	1	60	60	1.25	75	
B	127	Receptionist GS 5	Open	2	60	120	1.25	150	
B	128	File Room	Private	1	480	480	1.33	638	Secure Room
B	129	Supply Room	Private	1	100	100	1.33	133	
B	130	Mail & Copy Room	Private	1	150	150	1.33	200	
B	131	Conference Room (with workroom/layout space)	Private	1	400	400	1.33	532	
BRD - SBSC IT									
B	132	Offices GS 12	Private	1	150	150	1.33	200	Dale Blank - Located outside of Server Room
B	133	Offices GS 5 (PC Repair)	Open	2	60	120	1.25	150	outside of Server Room (need room for working on PCs)
B	134	Server Room (shared server room)	Private	1	0	0	1.33	0	Accessed through IT open office area
B	135	Plotter Room	Private	1	150	150	1.33	200	
B	136	Equipment Storage Room	Private	1	150	150	1.33	200	
BRD - SBSC Colorado Plateau									
B	137	Station Leader GS 13	Private	1	150	150	1.33	200	Mark S.
B	138	Scientist GS 12	Private	2	150	300	1.33	399	Charles D., Cathrine T
B	139	Technical Specialists GS 11	Private	2	150	300	1.33	399	Terry A, Ryan S.
B	140	GIS Techs GS 5	Open	2	60	120	1.25	150	
B	141	Office GS (2) 5 (2) 7	Open	4	75	300	1.25	375	Lisa G, JJ W., Christen P
BRD - SBSC Library									
B	142	Office GS 11	Private	1	150	150	1.33	200	Possibly add to Main Library
B	143	Office GS 5	Open	1	60	60	1.25	75	Stephanie
B	144	Library Stacks	Private	1	700	700	1.20	840	
B	145	Workroom	Private	1	300	300	1.33	399	electronic equipment for use by staff

Total NASF
Total GASF

9,260
12,112

Ref Code	Room/Area/Function		TYPE	No. of Rm	Room Siz	NASF	GASF	Fac	GASF	Occupant Names/Remarks
GIO / TELECOM										
C	101	Network Manager GS 13	Private	1	150	150	1.33	200		Chuck B
C	102	System Administrator GS 12	Private	1	150	150	1.33	200		John Z
C	103	Equipment Storage Room	Private	1	100	100	1.33	133		
C	103	Server Room (shared server room)	Private	1	900	900	1.20	1,080		BRD, Geography & GIO Combined Room
Total NASF						1,300				
Total GASF										1,613

Ref Code	Room/Area/Function		TYPE	No. of Rm	Room Siz	NASF	GASF	Fac	GASF	Occupant Names/Remarks
SHARED SPACES										
D	101	Conference Room	Private	1	700	700	1.20	840		18 + extras
D	102	Mail & Copy Room	Private	1	350	350	1.33	466		
D	103	Break Room	Private	1	400	400	1.33	532		
D	104	Lobby	Private	1	600	600	1.20	720		Adjacent to Biology Receptionist
Total NASF						2,050				
Total GASF										2,558

City of Flagstaff

USGS Master Plan

Warehouse

02/22/04

CODE	DEPARTMENT	NASF	GASF
A	OFFICE	780	1,012
B	GENERAL WAREHOUSE SPACE	4,820	5,620
C	SECURE STORAGE	4,610	5,473
D	WAREHOUSE VEHICLE PARKING	240	319
E	SHOPS	2,535	2,979
F	GCMRC	2,730	3,223
		Total NASF	18,626
		15,715	
			1.07
		Total GSF	19,930

Note:GASF: Gross Assignable Square Feet equals NASF plus the area needed for walls and immediate circulation.

City of Flagstaff

USGS Master Plan

Warehouse

02/22/04

Ref Code	Room/Area/Function		TYPE	No. of Rm	Room Siz	NASF	GASF	Fac GASF	Occupant Names/Remarks
OFFICE									
A	101	Facility Manager's Office	Open	1	330	330	1.25	413	2 contract employees and Facility Manager
A	102	Unisex Restroom	Private	1	60	60	1.33	80	
A	103	Emeritus Office	Private	1	150	150	1.33	200	
A	104	Mail Room	Private	1	240	240	1.33	319	
						780	1,012		
GENERAL WAREHOUSE SPACE									
A	105	Staging Area	Private	1	600	600	1.20	720	Unloading / sorting of materials from incoming delivery trucks
A	106	Field Lockers	Private	1	200	200	1.33	266	Need 10 - 4' w x 4' d x 8' t
A	107	Warehouse floor area	Private	1	3100	3,100	1.10	3,410	3100 sf existing
A	108	C - Van Storage Warehouse (part of warehouse floor a	Private	1	200	200	1.33	266	existing 1 c-van (8'w x 40'd) some can be stacked
A	109	C - Van Storage Geology (part of warehouse floor area	Private	1	160	160	1.33	213	existing 1 c-van (8'w x 40'd) can be stacked
A	110	C - Van Storage Astro (part of warehouse floor area)	Private	1	320	320	1.33	426	existing 2 c-van (8'w x 40'd) can be stacked
A	111	WRD & GCMRC Battery Charging Room	Private	1	80	80	1.33	106	acid based battery charging
A	112	Geology - Paleo Lab	Private	1	160	160	1.33	213	see notes on new lab (A 104)
						4,820	5,620		
SECURE STORAGE									
A	112	Purchasing & Admin Storage	Private	1	200	200	1.33	266	
A	113	Property Storage	Private	1	260	260	1.33	346	
A	114	Water Resources Division Storage	Private	1	650	650	1.20	780	
A	115	RPIF Map & Negative Storage	Private	1	2500	2,500	1.10	2,750	
A	116	Grounds and Maintenance Storage	Private	1	200	200	1.33	266	
A	117	C - Van Storage Astro (to be part of warehouse floor area)	Private	1	320	320	1.33	426	existing 2 c-van (8'w x 40'd) can be stacked
A	118	C - Van Storage RPIF (to be part of warehouse floor area)	Private	1	320	320	1.33	426	existing 1 c-van (8'w x 40'd)
A	119	C - Van Storage WRD (to be part of warehouse floor area)	Private	1	160	160	1.33	213	existing 1 c-van (8'w x 40'd) can be stacked
						4,610	5,473		
WAREHOUSE VEHICLE PARKING									
A	120	Bobcat & 3 Forklifts	Private	1	240	240	1.33	319	
						240	319		

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SHOPS									
A	121	Autoshop & Sheet Metal Room	Private	1	1200	1,200	1.10	1,320	basic maintenance & diagnostics for vehicles
A	122	Wood Shop	Private	1	900	900	1.20	1,080	
A	123	Machine Shop	Private	1	435	435	1.33	579	
A	124	Air Compressor	Private	1	0	0	1.33	0	
						2,535		2,979	
GCMRC									
A	124	C - Van Storage (to be part of warehouse floor area)	Private	1	160	160	1.33	213	existing 1 c-van (8'w x 40'd) can be stacked
A	125	Raft Repair Shop	Private	1	850	850	1.20	1,020	
A	126	Shop	Private	1	1300	1,300	1.10	1,430	
A	127	Logistic Coordinator Office GS 7	Private	1	100	150	1.33	200	
A	128	Logistic Coordinator Office GS 11	Private	1	100	150	1.33	200	
A	129	Storage	Private	1	120	120	1.33	160	
						2,730		3,223	

Total NASF

Total GASF

EXTERIOR SPACES

- 12 Covered Parking Spaces - GCMRC (12'x20') - one should be twice as long for stack bed
- 12 Covered Parking Spaces - WRD (12'x20')
- 12 Covered Parking Spaces - GD & ASTRO (12'x20')
- 11 Open Parking Spaces - GD (15'x40')
- 6 Open Parking Spaces - GCMRC Boat Trailers / Frames (12'x20')

- 7200 SF Layout / Staging Space - GCMRC
- 250 SF Layout / Staging Space - Warehouse
- 750 SF Layout / Staging Space - WRD
- Covered Loading / Staging Area - 2 vehicles (semi trailers) with one scissor lift
- Extra Parking for 20 River Runners

Non Warehouse Space: Locate outside of secured compound

- Two Refuge containers (6' x 10')
- One Recycle containers (6' x 10')
- Survey Marker - existing must remain

City of Flagstaff

USGS Master Plan

New Welcome Center Space Program

02/22/04

CODE	DEPARTMENT	NASF	Without Menlo Park	With Menlo Park
			GASF	GASF
A	ADMINISTRATION	3,175	4,131	4,131
B	LIBRARY (Relocation of existing library with some growth)	3,650	4,142	
C	LIBRARY (Relocation of existing & 2/3 Menlow Park Library Facilities)	17,510		19,717
D	DISPLAY / MUSEUM	620	775	775
E	GATHERING SPACES	3,600	4,041	4,041
		Total NASF	28,555	13,089
				28,664
		GASF to GSF Factor	1.32	1.32
		Total GSF	17,277	37,836

*Note:*GASF: Gross Assignable Square Feet equals NASF plus the area needed for walls and immediate circulation.

City of Flagstaff

USGS Master Plan

New Welcome Center Space Program

02/22/04

Ref Code	Room/Area/Function		TYPE	No. of Rm	Room Siz	NASF	GASF	Fac GASF	Occupant Names/Remarks
ADMINISTRATION									
Building 3: Administration									
A	101	Scienctist-in-Charge Office GS 14	Private	1	300	300	1.33	399	Derrick - Conference table for 6 in office
A	102	Administrative Specialist GS 9	Private	1	200	200	1.33	266	Juanita
A	103	Purchasing Office GS 6	Private	1	130	130	1.33	173	Olga
Building 4: BRD - SBSC Administration									
A	104	Budget Analyst GS 9	Private	2	100	200	1.33	266	
A	105	Accounting Tech GS 7	Private	1	100	100	1.33	133	
A	106	Admin Assistant GS 5	Open	1	60	60	1.25	75	
A	107	Receptionist GS 5	Open	1	60	60	1.25	75	
A	108	File Room	Private	1	480	480	1.33	638	Secure Room
Building 6: Astrogeology Administration									
A	109	Center AO GS 13	Private	1	225	225	1.33	299	Karen G
A	110	Budget Analyst GS 11	Private	1	150	150	1.33	200	Rosie C
A	111	Budget Specialist GS 9	Private	1	100	100	1.33	133	Rene J.
A	112	Admin Assistant GS 7	Private	1	100	100	1.33	133	Collete S.
A	113	Human Resource Specialist GS 7	Private	1	100	100	1.33	133	Wayne D
A	114	Receptionist GS 5	Open	1	60	60	1.25	75	Linda P
A	115	Admin Assistant GS 5	Private	1	60	60	1.33	80	Vacant
Shared Spaces									
A	116	Conference Room	Private	1	600	600	1.20	720	Hold 20 around table
A	117	Mail & Copy Room	Private	1	150	150	1.33	200	
A	118	Break Room	Private	1	100	100	1.33	133	
Total NASF						3,175			
Total GASF							4,131		

appendix

Ref Code	Room/Area/Function		TYPE	No. of Rm	Room Siz	NASF	GASF Fac	GASF	Occupant Names/Remarks
LIBRARY (Relocation of existing library with some growth)									
B	101	Office	Private	1	150	150	1.33	200	growth of 50 SF & 1 workstation @ 50 SF 20% growth in stacks area
B	102	Library Work Room	Private	1	200	200	1.33	266	
B	103	Library Open Area (Stacks)	Private	1	3100	3,100	1.10	3,410	
B	104	Circulation Desk	Private	1	200	200	1.33	266	
Total NASF						3,650			
Total GASF						4,142			
Ref Code	Room/Area/Function		TYPE	No. of Rm	Room Siz	NASF	GASF Fac	GASF	Occupant Names/Remarks
LIBRARY (Relocation of existing & 2/3 Menlow Park Library Facilities)									
C	101	Head Librarian's Office	Private	1	150	150	1.33	200	Menlow stacks is 12,000 SF + 3000 local
C	102	Open Offices	Open	4	80	320	1.25	400	
C	103	Library Work Room	Private	1	200	200	1.33	266	
C	104	Library Open Area (Stacks)	Private	1	15000	15,000	1.10	16,500	
C	105	Circulation Desk	Private	1	200	200	1.33	266	
C	106	Librarian Offices	Private	4	120	480	1.33	638	
BRD - SBSC Library									
C	107	Office GS 11	Private	1	100	100	1.33	133	Stephanie
C	108	Office GS 5	Open	1	60	60	1.25	75	electronic equipment for use by staff
C	109	Library Stacks	Private	1	700	700	1.20	840	
C	110	Workroom	Private	1	300	300	1.33	399	
Total NASF						17,510			
Total GASF						19,717			
Ref Code	Room/Area/Function		TYPE	No. of Rm	Room Siz	NASF	GASF Fac	GASF	Occupant Names/Remarks
DISPLAY / MUSEUM									
D	101	Astro/RPIF Planetary Display (Models & Posters)	Open	1	64	64	1.25	80	
D	102	Water Resources Display (Cable Car)	Open	1	64	64	1.25	80	
D	103	Large Format Camera	Open	1	300	300	1.25	375	
D	104	Geology Display (Rocks)	Open	1	64	64	1.25	80	
D	105	Biology Display (Animals)	Open	1	64	64	1.25	80	
D	106	Mapping Displays (Maps)	Open	1	64	64	1.25	80	
Total NASF						620			
Total GASF						775			

appendix

City of Flagstaff

USGS Master Plan

Building 3 Renovation

02/22/04

Ref Code	Room/Area/Function		TYPE	No. of Rm	Room Siz	NASF	GASF	Fac GASF	Occupant Names/Remarks
		RPF							
A	101	Resource Room	Private	1	330	330	1.33	439	lateral files, bookcases (IMAPS)
A	102	Office	Private	1	100	100	1.33	133	These spaces will be relocated into geography's old space.
						430		572	
		Total NASF							
		Total GASF							

SMITHGROUP

architecture engineering interiors